SUPER®

SUPER® X6DAT-G
SUPER® X6DAi-G

USER'S MANUAL

Revision 1.0

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Preface

About This Manual

This manual is written for system integrators, PC technicians and knowledgeable PC users. It provides information for the installation and use of the SUPERO® X6DAT-G/X6DAi-G motherboard. Installation and maintenance should be performed by experienced technicians only.

The SUPERO® X6DAT-G/X6DAi-G supports single or dual Intel® Xeon™ EM64T processors at an 800 MHz front side bus speed. Please refer to the motherboard specifications pages on our web site (http://www.supermicro.com/products/motherboard/) for updates on supported processors. This product is intended to be professionally installed.

Manual Organization

Chapter 1 begins with a checklist of what should be included in your mainboard box, describes the features, specifications and performance of the motherboard and provides detailed information about the chipset.

Chapter 2 begins with instructions on handling static-sensitive devices. Read this chapter when you want to install the processor and memory modules and when mounting the mainboard in the chassis. Also refer to this chapter to connect the floppy and hard disk drives, SATA drives, the IDE interfaces, the parallel and serial ports, the keyboard and mouse, the power supply and various control panel buttons and indicators.

If you encounter any problems, see **Chapter 3**, which describes troubleshooting procedures for the video, the memory and the setup configuration stored in CMOS. For quick reference, a general FAQ [Frequently Asked Questions] section is provided. Instructions are also included for contacting technical support. In addition, you can visit our web site (http://www.supermicro.com/support/) for more detailed information.

Chapter 4 includes an introduction to BIOS and provides detailed information on running the CMOS Setup utility.

Appendix A gives information on BIOS POST messages.

Appendix B lists software drivers, SATA HostRAID Utility and the OS installation instructions.

Appendix C provides information on installing Adaptec's SATA HostRAID Utility based on Marvell's SATA chip

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Chapter 1
Introduction

1-1 Overview

Checklist

Congratulations on purchasing your computer motherboard from an acknowledged leader in the industry. Supermicro boards are designed with the utmost attention to detail to provide you with the highest standards in quality and performance. Check that the following items have all been included with your motherboard. If anything listed here is damaged or missing, contact your retailer.

Note: Items listed below are included in retail box only.

One (1) Supermicro Mainboard

One (1) ribbon cable for IDE devices (CBL-036)

One (1) floppy ribbon cable (CBL-022)

Four (4) SATA cable (CBL-044) (*X6DAT-G)

One (1) SATA cable (CBL-044) (*X6DAi-G)

One (1) I/O back panel shield (CSE-PT2)

One (1) Supermicro CD containing drivers and utilities (CDR-INTC)

One (1) User's/BIOS Manual

Contacting Supermicro

Headquarters

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Email: support@supermicro.com.tw
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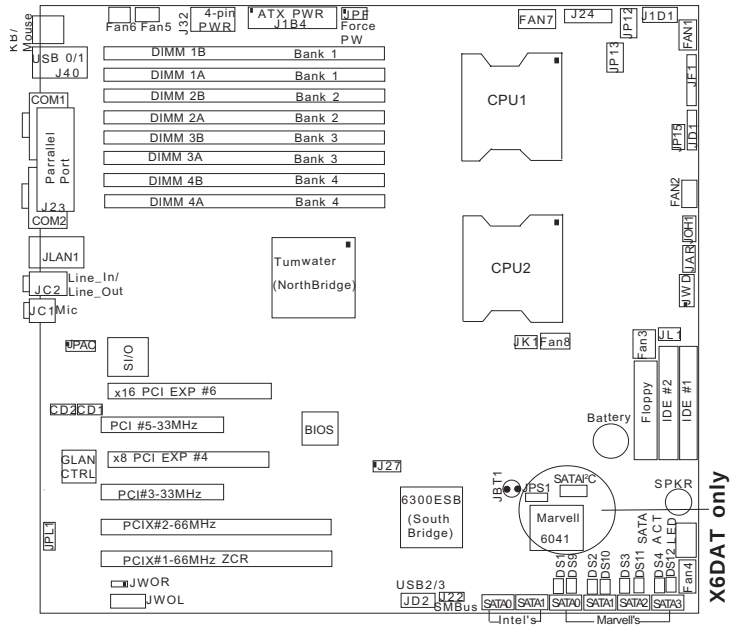
Figure 1-1. X6DAT-G/X6DAi-G Image

Note: Marvell SATA is available on the X6DAT-G only.

Figure 1-2. X6DAT-G/X6DAi-G Motherboard Layout

(not drawn to scale)



Notes:

1. Jumpers not indicated are for test purposes only.
2. See Chapter 2 for detailed information on jumpers, I/O ports and JF1 front panel connections.
3. "■" indicates the location of Pin 1.
4. The differences between the X6DAT-G and the X6DAi-G: In addition to the Intel SATA, there are four SATA ports supported by Marvell SATA chip.

Quick Reference

Jumper	Description	Default Setting
JBT1	CMOS Clear	(See Chapter 2)
JK1	Keylock Enable	Close (Enabled)
JP13	3rd PWR Supply Failure Alarm Enab.	Open (Disabled)
JP15	Reboot Option Enable	Open (Enabled)
JPAC	Audio Enable/Disable	Pins 1-2 (Enabled)
JPF	Force Power On	Open (Disabled)
JPL1	Giga-bit LAN Enable/Disable	Pins 1-2 (Enabled)
JPS1(*X6DAT)	Serial ATA Enabled	Pins 1-2 (Enabled)
JWD	Watch Dog Enable	Pins 1-2 (Reset)

Connector	Description
J1B4	Primary 24-pin ATX PWR Connector
J1D1,J32	12V 8-pin PWR/12V 4-pin CPU PWR Connectors
J6, J38	COM1/COM2 Serial Port Connectors
J3, J4	IDE1/2 Hard Disk Drive Connectors
J9	Keyboard/Mouse
J22	System Management Bus
J23	Parallel (Printer) Port
J24	Power System Management Bus
JAR	PWR Fail Alarm Reset
JC1, JC2	Audio: Mic(JC1), Line-In/Line-Out(JC2)
JD1	PWR LED (Pins1-3), Speaker (Pins 4-7)
JF1	Front Panel Control
JL1	Chassis Intrusion Header
JOH1	Overheat LED
JP8	Floppy Disk Drive Connector
JP12	Power Fault Connector
JHS1/JHS2	I-SATA0/1:Intel (6300 ESB) Serial ATA0/1 Headers
JLAN1	G-bit Ethernet Port
JS1-JS4 (*X6DAT only)	M-SATA0-3:Mavell's Serial ATA 0-3 Headers
JS10 (*X6DAT only)	SATA I^2C:Serial ATA System Management Bus
JS9 (*X6DAT only)	Serial ATA Activity LED Connector
FAN #1-#8	Chassis Fans Headers/CPU Fan1/CPU Fan2
DIMM#1A-#4B	Memory (RAM) Slots#(1A,1B, 2A,2B, 3A,3B,4A,4B)
DS1-4,DS9-12 (*X6DAT)	Marvell's SATA Status LEDs (*DS1:PRE0, DS9:ACT0/DS2:PRE1, DS10:ACT1/DS3:PRE2, DS11:ACT2/DS4:PRE3,D12:ACT3)
WOL(JWOL)	Wake-on-LAN Header
WOR(JWOR)	Wake-on-Ring Header
USB#0-1(J40)	(Back Panel) Universal Serial Bus Ports
USB#2-3(JD2)	(Front Panel) Universal Serial Bus Headers

Motherboard Features

CPU

- Single or dual 604-pin Intel® Xeon™ (EM64T) processors @ 800 MHz front side (system) bus speed.

Memory

- Eight 184-pin DIMM sockets supporting up to 16 GB ECC registered DDR333 or up to 32 GB ECC registered DDR266 SDRAM

Note: Interleaved memory; requires memory modules to be installed in pairs (see Section 2-3 for details).

Chipset

- Intel E7525 (Tumwater) chipset and 6300ESB (Hance Rapids)

Expansion Slots

- One PCI-Express x16 slot
- One PCI-Express x8 slot (x8 signal, x16 slot)
- Two 64-bit, 66 MHz PCI-X slots (one w/ZCR support--Slot#1)
- Two 32-bit, 33MHz PCI slots

BIOS

- 8 Mb Phoenix Flash BIOS ROM
- APM 1.2, DMI 2.1, PCI 2.2, ACPI 2.0, Plug and Play (PnP), SMBIOS 2.3

PC Health Monitoring

- Onboard voltage monitors for CPU cores, chipset voltage, Memory Voltage 3.3V, +5V, +12V, –12V and 5V standby
- Fan status monitor with speed control via BIOS
- CPU/chassis temperature monitors
- Environmental temperature monitor and control via Supero Doctor III
- CPU fan auto-off in sleep mode
- CPU slow-down on temperature overheat
- CPU thermal trip support for processor protection, +5V standby alert LED
- Power-up mode control for recovery from AC power loss
- Auto-switching voltage regulator for CPU core
- System overheat/Fan Fail LED and control
- Chassis intrusion detection
- System resource alert via Super Doctor III

ACPI Features

- Microsoft OnNow
- Slow blinking LED for suspend state indicator
- Main switch override mechanism

Onboard I/O

- Marvell SATA controller (*X6DAT-G only)
- One Intel 8254x Gigabit Ethernet controller (supports 1 GLAN port)
- 2 EIDE Ultra DMA/100 bus master interfaces
- 1 floppy port interface (up to 2.88 MB)
- 1 EPP/ECP Parallel Port
- PS/2 mouse and PS/2 keyboard ports
- Up to four USB 2.0 (Universal Serial Bus):

(2 Back Panel USB ports & 2 Front Panel USB headers)

- 2 serial (COM) ports
- 2 Intel 6300 ESB Serial ATA Headers w/RAID 0, 1 support
- 4 Marvell Serial ATA Headers (*X6DAT-G only)
- AC'97 Audio CODEC six-channel sound

Other

- Internal/external modem ring-on
- Wake-on-Ring (WOR)
- Wake-on-LAN (WOL)
- Console redirection

CD/Diskette Utilities

- BIOS flash upgrade utility and device drivers

Dimensions

- ATX Ext. 12" x 13.05" (304.8 x 331.5 mm)

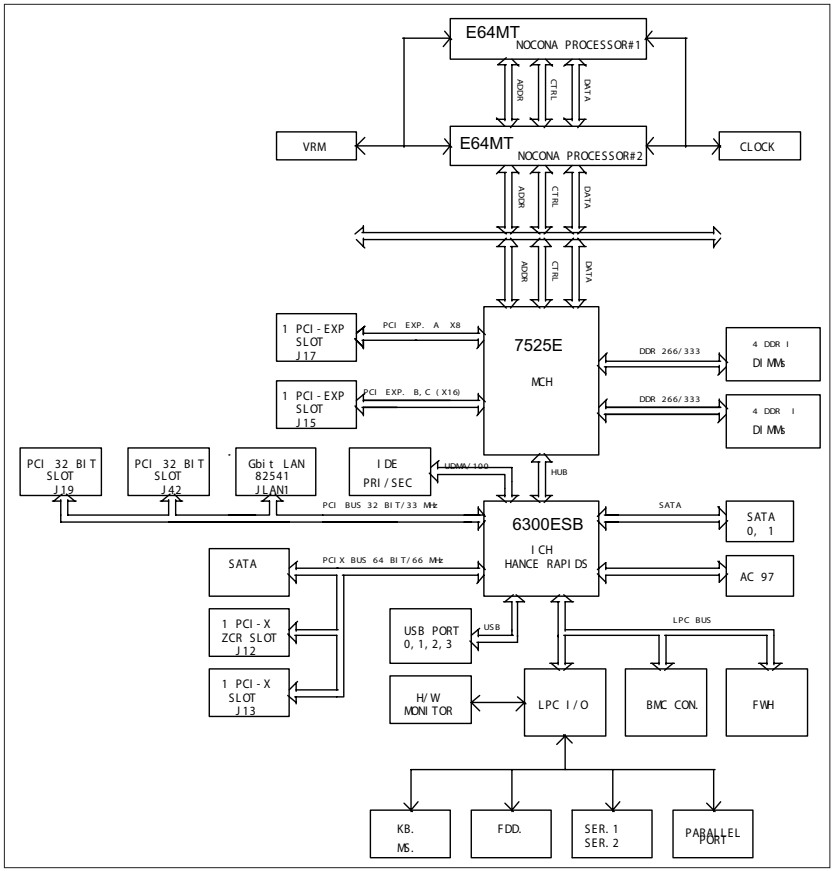


Figure 1-9. Block Diagram of the E7525 Tumwater Chipset

Note: This is a general block diagram. Please see the previous Motherboard Features pages for details on the features of each motherboard.

1-2 Chipset Overview

Built upon the functionality and capabilities of the E7525 chipset, the X6DAT-G/X6DAi-G motherboard provides the performance and feature set required for dual processor-based computer systems, with configuration options optimized for communications, presentation, storage, computation and database applications. The Intel E7525 chipset consists of the following components: the Memory Controller Hub (MCH), and the I/O Controller Hub (6300 ESB ICH)).

MCH

The MCH supports single or dual Xeon EM64T processors with a Front Side Bus speed of 800 MHz*. Its memory controller provides direct connection to two channels of registered DDR333 with a marched system bus address and data bandwidths of up to 2.67 GB/s (DDR333) per channel. The MCH also supports the new PCI Express high speed serial I/O interface for superior I/O bandwidth and provides configurable x16 and x8 PCI Express interfaces. These interfaces support connection of the MCH to a variety of other bridges that are compliant with the PCI Express Interface Specification Rev. 1.0a. The MCH interfaces with the 6300ESB ICH I/O Controller Hub via HI 1.5 Hub Interface to support 32-bit or 64-bit PCI devices running at 33 or 66 MHz.

6300 ESB (Hance Rapids) ICH System Features

In addition to providing the I/O subsystem with access to the rest of the system, the Hance Rapids ICH I/O Controller Hub integrates many I/O functions.

The 6300 ESB Hance Rapids ICH I/O Controller Hub integrates: 2-channel Ultra ATA/100 Bus Master IDE Controller, two Serial ATA (SATA) Host Controllers, SMBus 2.0 Controller, LPC/Flash BIOS Interface, PCI-X (66MHz) Interface, PCI 2.2 Interface and System Management Controller.

***Note:** The CPU FSB speed is set at 800 MHz by the Manufacturer. Please do not change the this setting.

1-3 Special Features

Recovery from AC Power Loss

BIOS provides a setting for you to determine how the system will respond when AC power is lost and then restored to the system. You can choose for the system to remain powered off (in which case you must hit the power switch to turn it back on) or for it to automatically return to a power-on state. See the Power Lost Control setting in the Advanced BIOS Setup section (Peripheral Device Configuration) to change this setting. The default setting is Last State.

1-4 PC Health Monitoring

This section describes the PC health monitoring features of the SUPER X6DAT-G/X6DAi-G. All have an onboard System Hardware Monitor chip that supports PC health monitoring.

Onboard Voltage Monitors for the CPU Cores, Chipset Voltage, Memory Voltage, +3.3V, +5V, +12V, -12V and +5V Standby

An onboard voltage monitor will scan these voltages continuously. Once a voltage becomes unstable, a warning is given or an error message is sent to the screen. Users can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

Fan Status Monitor with Fan Speed Control

The PC health monitor can check the RPM status of the cooling fans. The onboard 4-pin CPU and chassis fans are controlled by the thermal management functions under in the BIOS.

Environmental Temperature Control via Supero Doctor III

The thermal control sensor monitors the CPU temperature in real time and will trigger the fan to speed up whenever the CPU temperature exceeds a user-defined threshold. The overheat circuitry runs independently from the CPU. It can continue to monitor for overheat conditions even when the CPU is in sleep mode. Once it detects that the CPU temperature is too high, it will automatically trigger the fan to speed up to prevent any overheat damage to

the CPU. The onboard chassis thermal circuitry can monitor the overall system temperature and alert users when the chassis temperature is too high.

CPU Fan Auto-Off in Sleep Mode

The CPU fan activates when the power is turned on. It continues to operate when the system enters Standby mode. When in sleep mode, the CPU will not run at full power, thereby generating less heat.

CPU Overheat/Fan Fail LED and Control

This feature is available when the user enables the CPU overheat/Fan Fail warning function in the BIOS. This allows the user to define an overheat temperature. When this temperature is exceeded or when a fan failure occurs, then, the Overheat/Fan Fail warning LED is triggered.

Auto-Switching Voltage Regulator for the CPU Core

The auto-switching voltage regulator can auto-detect and regulate power supply to the CPU. This will allow the regulator to run cooler and thus make the system more stable.

TM2/CPU VRM Overheat

When the CPU reaches 90^0 C and above (Overheat), the CPU will slow down and CPU Voltage will decrease to reduce CPU power consumption and VRM heat dissipation.

When CPU temperature reaches 90^0 C and above (*Default), the system will go into the throttling state. The Overheat LED and Alarm Buzzer will be turned on. The CPU performance will drop 50%. When this happens, you can go to the Health Monitor Setting in the BIOS to reset CPU Overheat Temperature.

1-5 ACPI Features

ACPI stands for Advanced Configuration and Power Interface. The ACPI specification defines a flexible and abstract hardware interface that provides a standard way to integrate power management features throughout a PC system, including its hardware, operating system and application soft-

ware. This enables the system to automatically turn on and off peripherals such as CD-ROMs, network cards, hard disk drives and printers. This also includes consumer devices connected to the PC such as VCRs, TVs, telephones and stereos.

In addition to enabling operating system-directed power management, ACPI provides a generic system event mechanism for Plug and Play and an operating system-independent interface for configuration control. ACPI leverages the Plug and Play BIOS data structures while providing a processor architecture-independent implementation that is compatible with Windows 2000, Windows NT 5.0, Windows XP and Windows Server 2003.

Microsoft OnNow

The OnNow design initiative is a comprehensive, system-wide approach to system and device power control. OnNow is a term for a PC that is always on but appears to be off and responds immediately to user or other requests.

Slow Blinking LED for Suspend-State Indicator

When the CPU goes into a suspend state, the chassis power LED will start blinking to indicate that the CPU is in suspend mode. When the user presses any key, the CPU will wake-up and the LED will automatically stop blinking and remain on.

Main Switch Override Mechanism

When an ATX power supply is used, the power button can function as a system suspend button to make the system enter a SoftOff state. The monitor will be suspended and the hard drive will spin down. Depressing the power button again will cause the whole system to wake-up. During the SoftOff state, the ATX power supply provides power to keep the required circuitry in the system alive. In case the system malfunctions and you want to turn off the power, just depress and hold the power button for 4 seconds. This option can be set in the Power section of the BIOS Setup routine.

External Modem Ring-On (WOR)

Wake-up events can be triggered by a device such as the external modem ringing when the system is in the SoftOff state. Note that external modem ring-on can only be used with an ATX 2.01 (or above) compliant power supply.

1-6 Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. It is even more important for processors that have high CPU clock rates.

The SUPER X6DAT-G/X6DAi-G accommodates ATX power supplies. Although most power supplies generally meet the specifications required by the CPU, some are inadequate. You should use one that will supply at least 400W of power. **A 12V 8-pin power connection (at J1D1) is required for CPU power consumption, and an additional 12V 4-pin power connection (J32) is also recommended for heavy load configurations.)** Also your power supply must supply 1.5A for the Ethernet ports. It is strongly recommended that you use a high quality power supply that meets ATX power supply Specification 2.02 or above. It must also be SSI compliant (info at http://www.ssiforum.org/). Additionally, in areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges.

1-7 Super I/O

The disk drive adapter functions of the Super I/O chip include a floppy disk drive controller that is compatible with industry standard 82077/765, a data separator, write pre-compensation circuitry, decode logic, data rate selection, a clock generator, drive interface control logic and interrupt and DMA logic. The wide range of functions integrated onto the Super I/O greatly reduces the number of components required for interfacing with floppy disk drives. The Super I/O supports 360 K, 720 K, 1.2 M, 1.44 M or 2.88 M disk drives and data transfer rates of 250 Kb/s, 500 Kb/s or 1 Mb/s.It also provides two high-speed, 16550 compatible serial communication ports (UARTs), one of which supports serial infrared communication. Each UART includes a 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability and a processor interrupt system. Both

UARTs provide legacy speed with baud rate of up to 115.2 Kbps as well as an advanced speed with baud rates of 250 K, 500 K, or 1 Mb/s, which support higher speed modems.

The Super I/O supports one PC-compatible printer port (SPP), Bi-directional Printer Port (BPP) , Enhanced Parallel Port (EPP) or Extended Capabilities Port (ECP).

The Super I/O provides functions that comply with ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power management through an SMI or SCI function pin. It also features auto power management to reduce power consumption.

The IRQs, DMAs and I/O space resources of the Super I/O can flexibly adjust to meet ISA PnP requirements, which support ACPI and APM (Advanced Power Management).

Chapter 2
Installation

2-1 Static-Sensitive Devices

Electric-Static-Discharge (ESD) can damage electronic components. To prevent damage to your system board, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Handle the board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.
- Use only the correct type of onboard CMOS battery as specified by the manufacturer. Do not install the onboard battery upside down to avoid possible explosion.

Unpacking

The motherboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

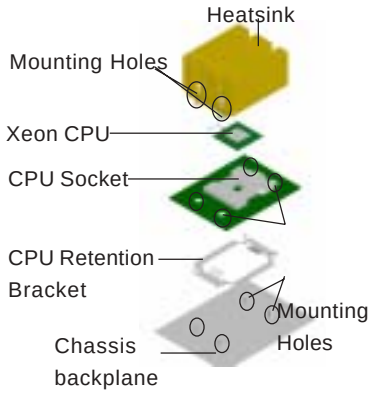
2-2 Xeon EM64T Processor and Heatsink Installation

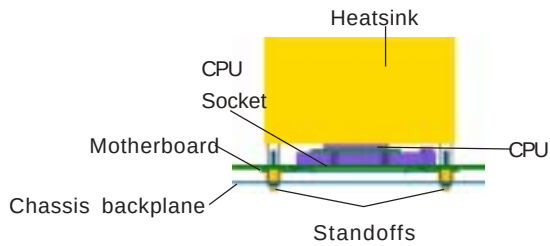
When handling the processor package, avoid placing direct pressure on the label area of the fan. Also, do not place the motherboard on a conductive surface, which can damage the BIOS battery and prevent the system from booting up.

IMPORTANT: Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket **before** you install the CPU heat sink.

Installing the CPU Mounting Plate and Retention Bracket

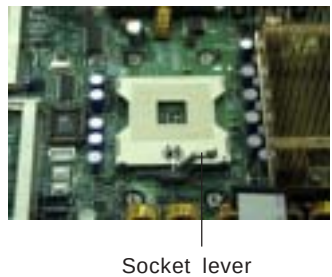
CPU retention brackets are pre-installed.



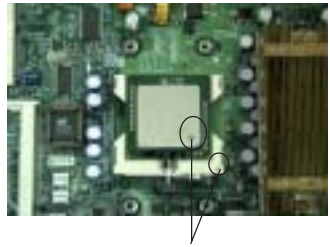


CPU Installation

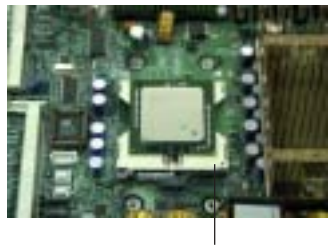
1. Lift the lever on the CPU socket: lift the lever completely as shown on the picture on the right, otherwise you will damage the CPU socket when power is applied. (Install CPU1 first.)



2. Insert the CPU in the socket, making sure that pin 1 of the CPU aligns with pin 1 of the socket (both corners are marked with a triangle). When using only one CPU, install it into CPU socket #1 (socket #2 is automatically disabled if only one CPU is used).



3. Press the lever down until you hear the *click*. This means that the CPU is securely installed in the CPU socket.



Heatsink Installation

(*Heatsinks are heavy. Please handle with care.)

1. Do not apply any thermal compound to the heatsink or the CPU die; the required amount has already been applied.

2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the retention mechanism.

3. Screw in two diagonal screws (ie the #1 and the #2 screws) until just snug (do not fully tighten the screws to avoid possible damage to the CPU).

4. Finish the installation by fully tightening all four screws.

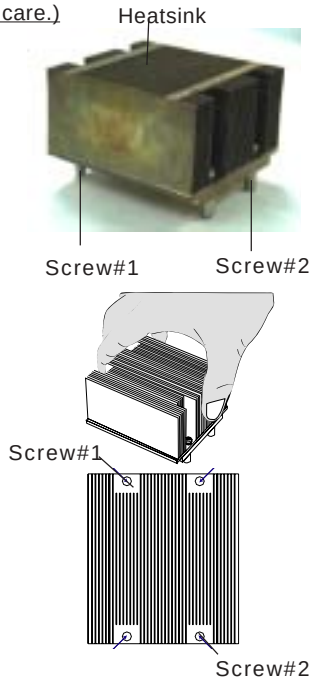
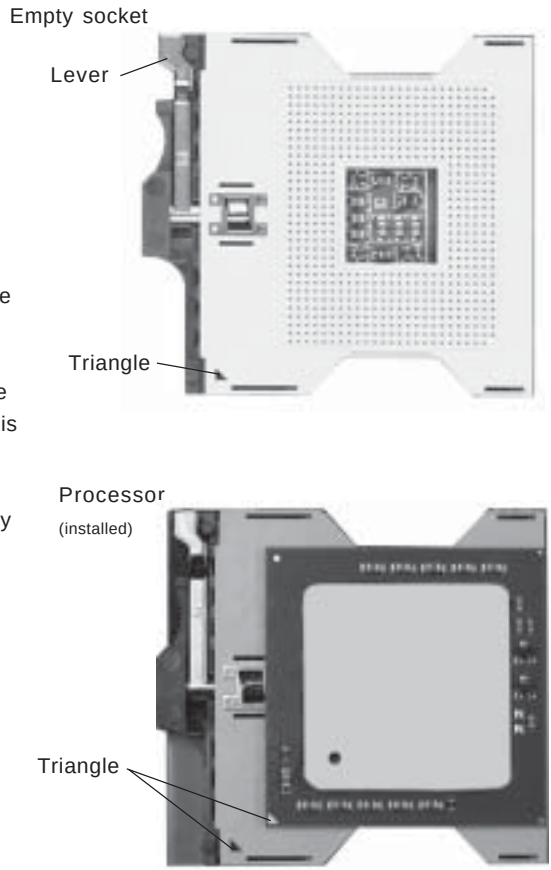


Figure 2-1. PGA604 Socket: Empty and with Processor Installed



Warning! Make sure you lift the lever completely when installing the CPU. If the lever is only partly raised, damage to the socket or CPU may result.

Mounting the Motherboard in the Chassis

All motherboards have standard mounting holes to fit different types of chassis. Make sure that the locations of all the mounting holes for both the motherboard and the chassis match. Although a chassis may have both plastic and metal mounting fasteners, metal ones are highly recommended because they ground the motherboard to the chassis. Make sure that the metal standoffs click in or are screwed in tightly. Then use a screwdriver to secure the motherboard onto the motherboard tray.

2-3 Installing DIMMs

Note: Check the Supermicro web site for recommended memory modules.

CAUTION

Exercise extreme care when installing or removing DIMM modules to prevent any possible damage. Also note that the memory is interleaved to improve performance (see step 1).

DIMM Installation (See Figure 2-2)

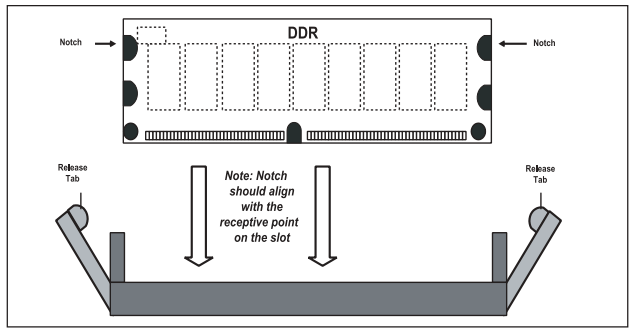
1. Insert the desired number of DIMMs into the memory slots, starting with DIMM #1A. The memory scheme is interleaved so you must install two modules of the same memory type and of the same memory speed at a time, beginning with DIMM #1A, then DIMM #1B, and so on.
2. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the DIMM module incorrectly.
3. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules (see step 1 above).

Memory Support

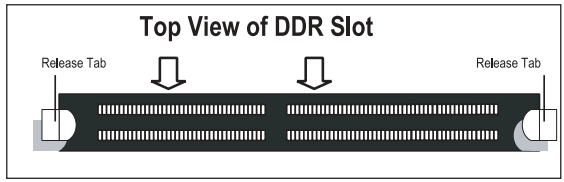
The X6DAT-G/X6DAi-G supports up to 16 GB of ECC registered DDR333 or up to 32 GB of ECC registered DDR266 SDRAM memory. Both motherboards were designed to support 4 GB modules in each slot, but have only been verified for up to 2 GB modules. (*When Registered ECC DDR333-PC2700 memory modules are used, we recommend that up to four pieces of double-banked memory modules or up to six pieces of single-banked memory modules be installed on the motherboard.)

Figure 2-2. Installing and Removing DIMMs

To Install: Insert module vertically and press down until it snaps into place. Pay attention to the alignment notch at the bottom.



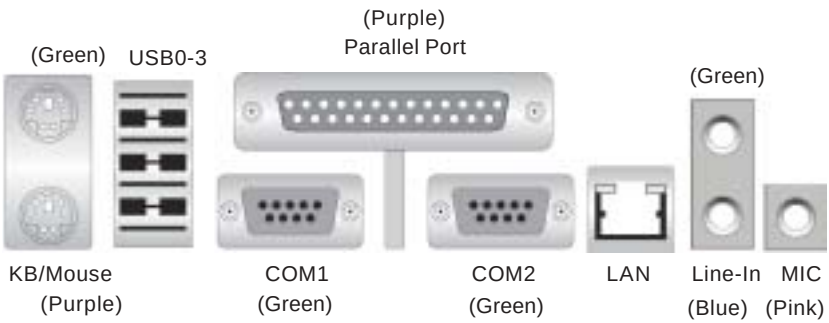
To Remove:
Use your thumbs to gently push near the edge of both ends of the module. This should release it from the slot.



2-4 I/O Ports/Control Panel Connectors

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 2-3 below for the colors and locations of the various I/O ports.

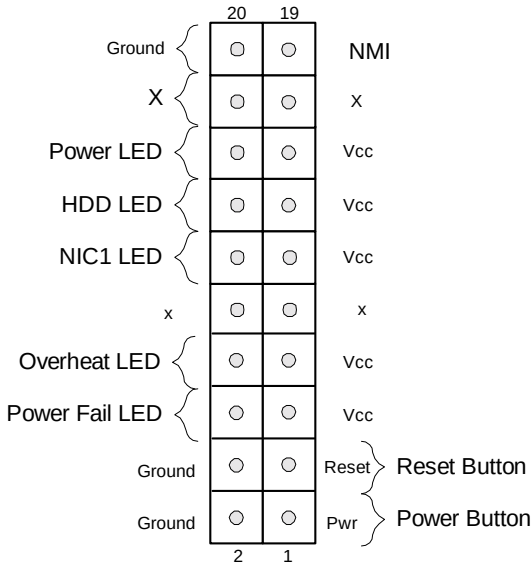
Figure 2-3. I/O Port Locations and Definitions



Front Control Panel

JF1 contains header pins for various buttons and indicators that are normally located on a control panel at the front of the chassis. These connectors are designed specifically for use with Supermicro server chassis. See Figure 2-4 for the descriptions of the various control panel buttons and LED indicators. Refer to the following section for descriptions and pin definitions.

Figure 2-4. JF1 Header Pins



2-5 Connecting Cables

ATX Power Connector

There are a 24-pin main power supply connector(PW1:J1B4) and a 4-pin CPU PWR connector (J32) on the board. These power connectors meet the SSI EPS 12V specification. Both power connectors are required to ensure sufficient power supply. See the table on the right for pin definitions. For CPU PWR (J1D1), please refer to the item listed below.

ATX Power Supply 24-pin Connector Pin Definitions (J1B4)

Pin Number	Definition	Pin Number	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON#	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res(NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

+12V 4-pin Connector (J32)

Required Connection

Pins #	Definition
1 & 2	Ground
3 & 4	+12 V

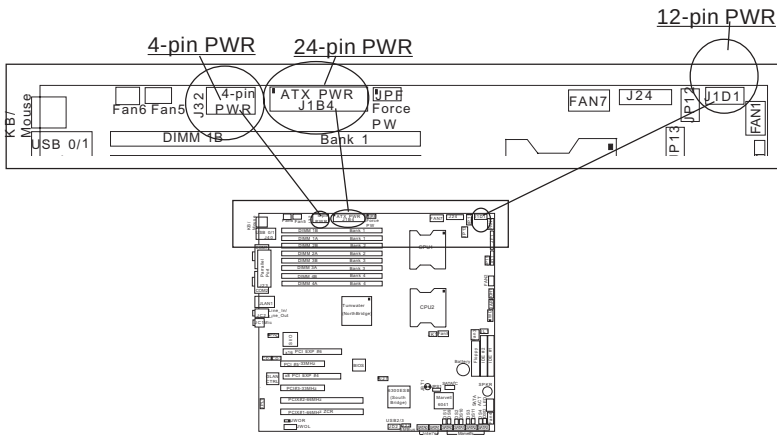
Processor Power Connector

In addition to the Primary ATX power connector (above), the 12v 8-pin Processor connector at J1D1 must also be connected to your power supply. See the table on the right for pin definitions.

CPU 8-Pin PWR Connector (J1D1)

Pins	Definition
1 thru 4	Ground
5 thru 8	+12v

Required Connection



NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

NMI Button Pin Definitions (JF1)

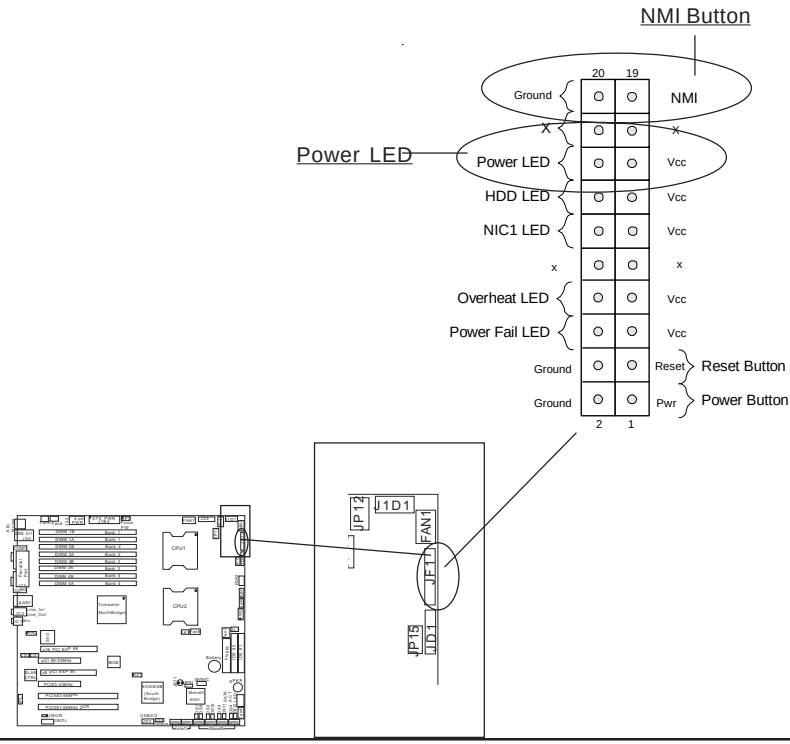
Pin Number	Definition
19	Control
20	Ground

Power LED

The Power LED connection is located on pins 15 and 16 of JF1. Refer to the table on the right for pin definitions.

PWR_LED Pin Definitions (JF1)

Pin Number	Definition
15	Vcc
16	Control



HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. Attach the hard drive LED cable here to display disk activity (for any hard drives on the system, including Serial ATA and IDE). See the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)

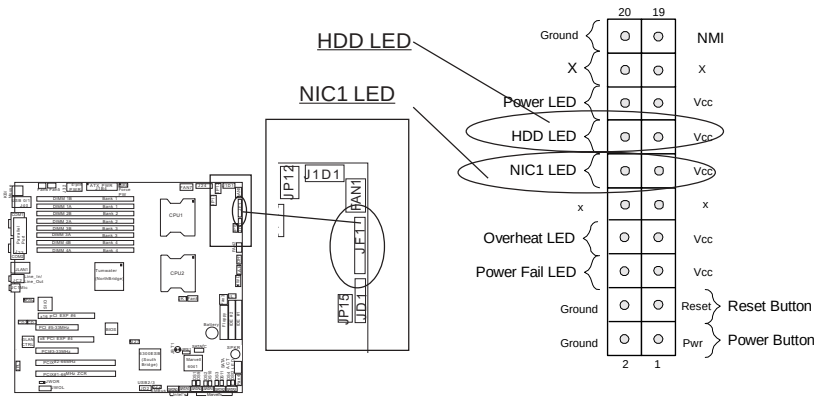
Pin Number	Definition
13	Vcc
14	HD Active

NIC1 LED Indicator

The NIC1 (Network Interface Controller) LED connections for the GLAN port1 is located on pins 11 and 12 of JF1. Attach the NIC LED cable to display network activity. Refer to the tables on the right for pin definitions.

NIC1 LED Pin Definitions (JF1)

Pin Number	Definition
11	Vcc
12	GND



Overheat/Fan Fail LED

Connect an LED to the OH/Fan Fail connection on pins 7 and 8 of JF1 to provide advanced warning of chassis overheating. Refer to the table on the right for pin definitions.

Overheat (OH) LED Pin Definitions (JF1)

Pin Number	Definition
7	Vcc
8	GND

Overheat/Fan Fail LED

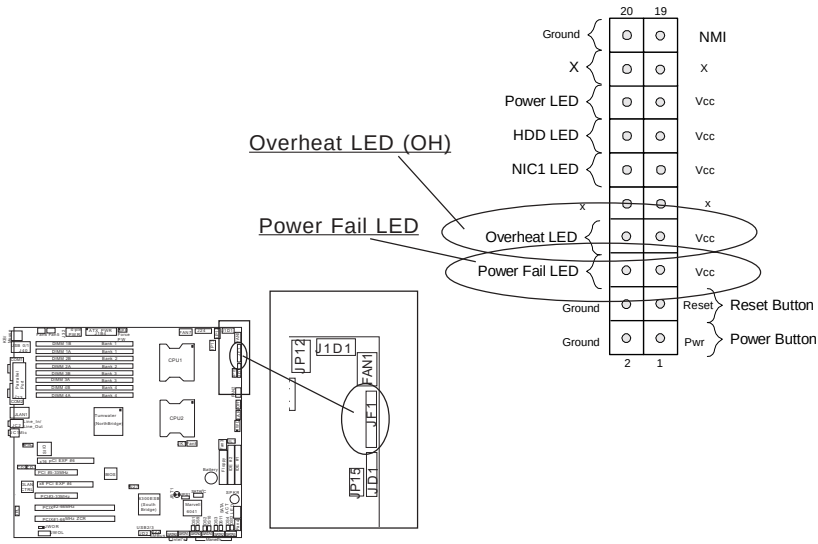
State	Message
Solid	Overheat
Blink	Fan Fail

Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

Power Fail LED Pin Definitions (JF1)

Pin Number	Definition
5	Vcc
6	GND



Reset Button

The Reset Button connection is located on pins 3 and 4 of JF1. Attach it to the hardware reset switch on the computer case. Refer to the table on the right for pin definitions.

Reset Pin Definitions (JF1)

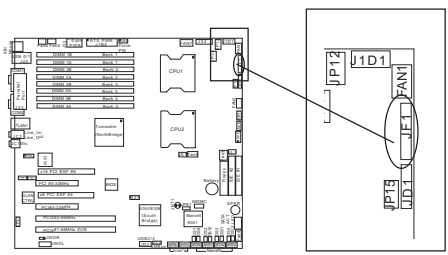
Pin Number	Definition
3	Reset
4	Ground

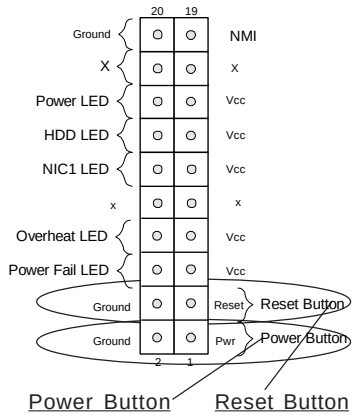
Power Button

The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (with a setting in BIOS - see Chapter 4). To turn off the power when set to suspend mode, depress the button for at least 4 seconds. Refer to the table on the right for pin definitions.

Power Button Connector Pin Definitions (JF1)

Pin Number	Definition
1	PW_ON
2	Ground





Chassis Intrusion

A Chassis Intrusion header is located at JL1. Attach the appropriate cable to inform you of a chassis intrusion.

Chassis Intrusion Pin Definitions (JL1)

Pin Number	Definition
1	Intrusion Input
2	Ground

Universal Serial Bus (USB)

There are four USB 2.0 (Universal Serial Bus) ports/headers on the motherboard. Two of them are Back Panel USB ports (USB#0-1:J40), and the other two are Front Panel USB headers (USB#2-3:JD2). See the tables on the right for pin definitions.

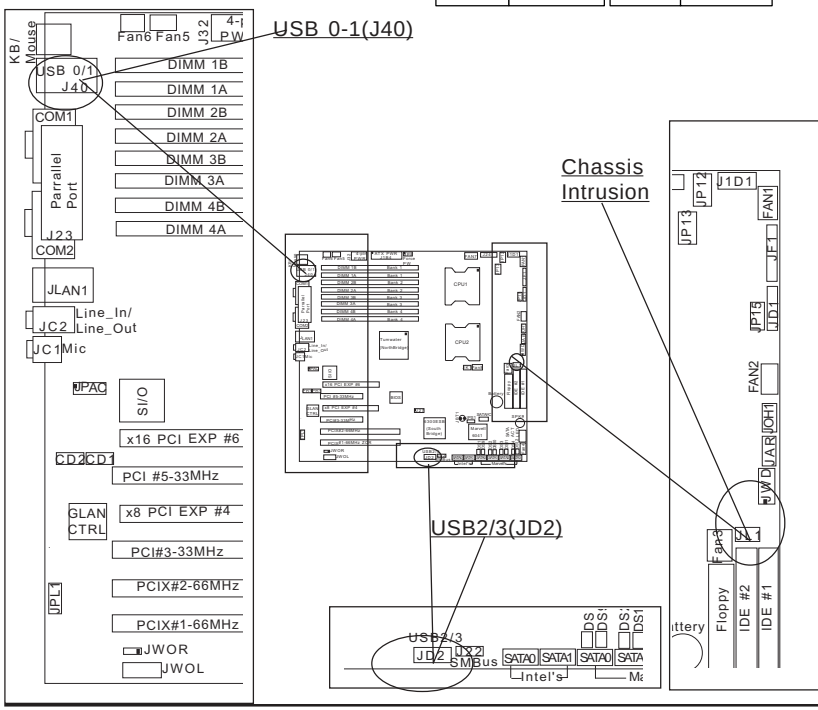
USB Pin Definition

J40 (Back Panel USB)

Pin#	Definition
1	+5V
2	P0-
3	P0+
4	Ground

JD2 (FP USB)

Pin Number	Definition	Pin Number	Definition
1	+5V	2	+5V
3	PO-	4	PO-
5	PO+	6	PO+
7	Ground	8	Ground
		10	Ground



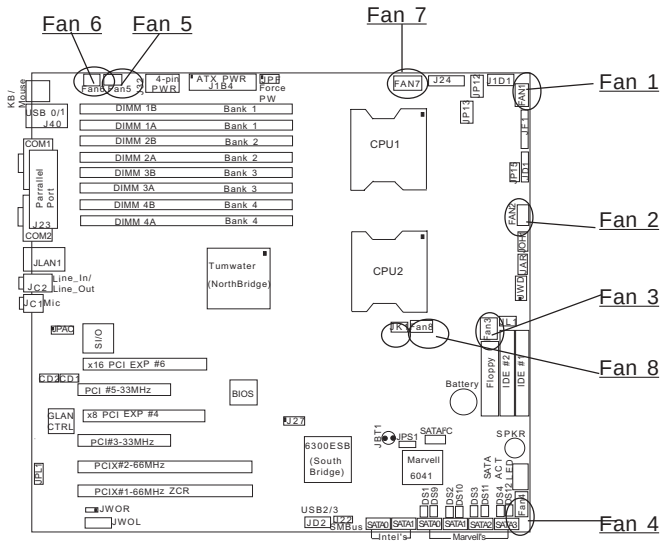
Fan Headers

There are eight fan headers (Fan 1 to Fan 8) on the X6DAT-G/X6DAi-G. See the table on the right for pin definitions. (*Note: These fan headers are 4-pin fans. Pins 1-3 of the fan headers are backward compatible with the traditional 3-pin fans.)(*The onboard fan speed is controlled by Thermal Management via BIOS--Hardware Monitor in the Advanced Setting. Note: Default: Disabled, When using Thermal Management setting, please use all 3-pin fans or all 4-pin fans on the motherboard. Please do not use 3-pin fans and 4-pin fans on the same board.)

4-pin Fan Header Pin Definitions (CPU and Chassis Fans)

Pin#	Definition
1	Ground (black)
2	+12V (red)
3	Tachometer
4	PWR_Control

Caution: These fan headers use DC power.



Wake-On-Ring

The Wake-On-Ring header is designated JWOR. This function allows your computer to receive and "wake-up" by an incoming call to the modem when in suspend state. See the table on the right for pin definitions. You must have a Wake-On-Ring card and cable to use this feature.

Wake-on-Ring Pin Definitions (JWOR)

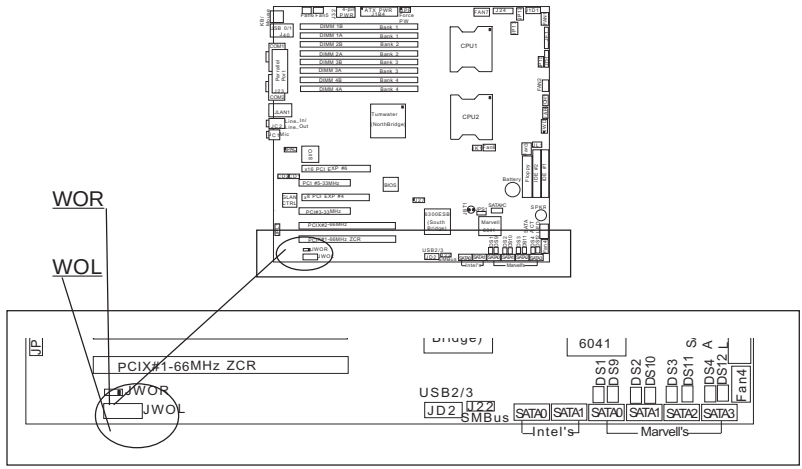
Pin Number	Definition
1	Ground
2	Wake-up

Wake-On-LAN

The Wake-On-LAN header is located at JWOL on the motherboard. See the table on the right for pin definitions. You must enable the LAN Wake-Up setting in BIOS to use this function. (You must also have a LAN card with a Wake-On-LAN connector and cable to use this feature.)

Wake-On-LAN Pin Definitions (JWOL)

Pin Number	Definition
1	+5V Standby
2	Ground
3	Wake-up



GLAN (Giga-bit Ethernet Port)

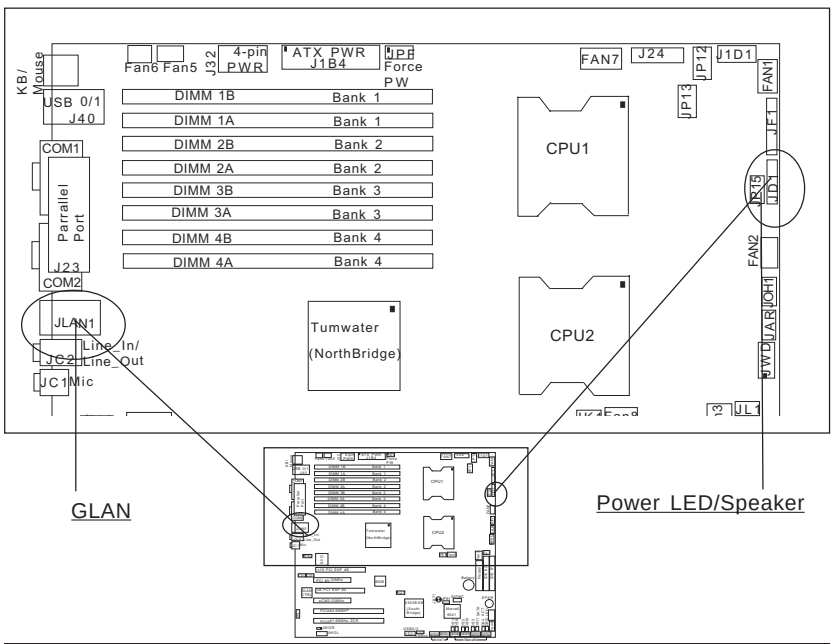
A G-bit Ethernet port is located beside the COM2 port on the IO backplane. This port accepts RJF1 type cables.

Power LED/Speaker

On the JD1 header, pins 1-3 are for a power LED and pins 4-7 are for the speaker. See the table on the right for speaker pin definitions. Note: The speaker connector pins are for use with an external speaker. If you wish to use the onboard speaker, you should close pins 6-7 with a jumper.

Speaker Connector Pin Definitions (JD1)

Pin Number	Function	Definition
4	+	Red wire, Speaker data
5	Key	No connection
6		Key
7		Speaker data



Power Fault

Connect a cable from your power supply to the Power Fail header (JP12) to provide warning of power supply failure. This warning signal is passed through the PWR_LED pin to indicate of a power failure on the chassis. See the table on the right for pin definitions.

Power Fail
Pin Definitions (JP12)

Pin Number	Definition
1	P/S 1 Fail Signal
2	P/S 2 Fail Signal
3	P/S 3 Fail Signal
4	Reset (from MB)

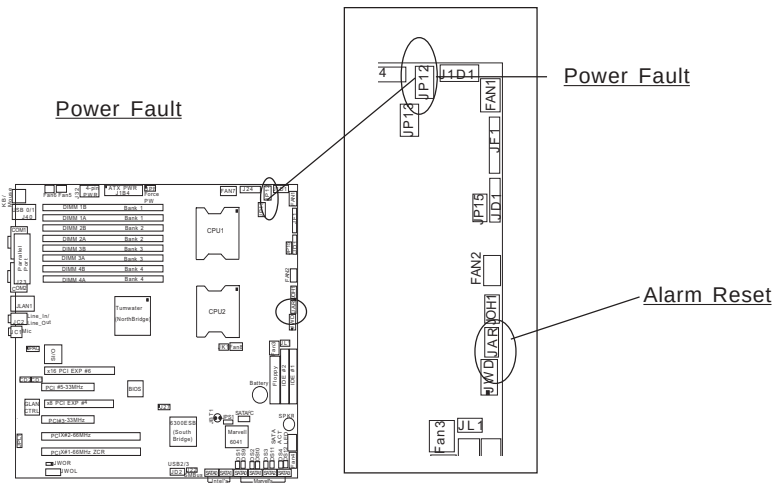
Note: This feature is only available when using redundant Supermicro power supplies.

Alarm Reset

Connecting JAR to a reset switch will allow you to silence the alarm that sounds when a power supply module fails. If you only have a single power supply installed, you should disable this (the default setting) with (JAR) to prevent false alarms. See the table on the right for pin definitions.

Alarm Reset Jumper Settings (JAR)

Jumper Position	Definition
Open	Enabled
Closed	Disabled



Overheat LED (JOH1)

The JOH1 header is used to connect an LED to provide warning of chassis overheating. Refer to the table on right for pin definitions.

Table 2-15
Overheat LED
Pin Definitions (JOH1)

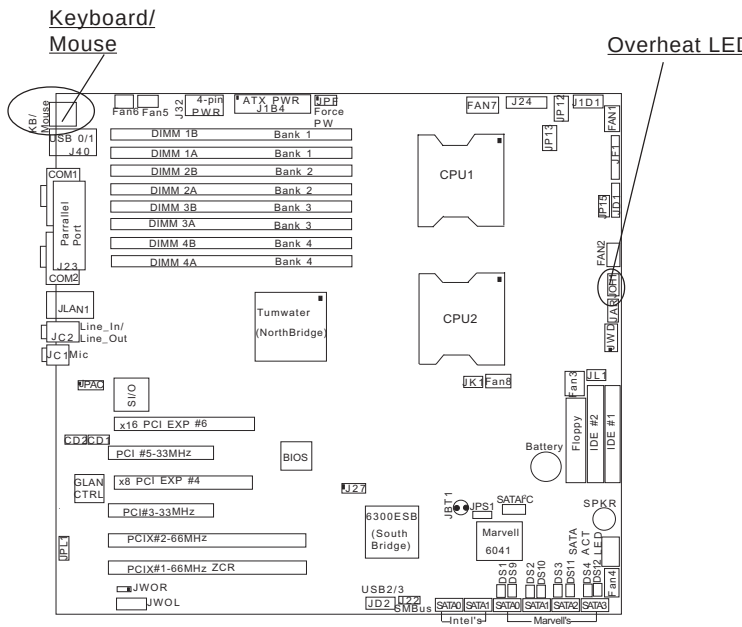
Pin Number	Definition
1	OH Active
2	Ground

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse are located at J9. See the table on the right for pin definitions. (The mouse port is above the keyboard port. See the table on the right for pin definitions.)

PS/2 Keyboard and Mouse Port Pin Definitions (J9)

Pin Number	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC



CD-In Header

There is two 4-pin CD headers on the motherboard. This allows you to use the onboard sound for audio CD playback. Connect the audio cables from your CD drive to the header. See the tables at right for pin definitions.

Audio CD Header Pin Definitions (CD1)

Pin Number	Definition
1	Left Stereo Signal
2	Ground
3	Ground
4	Right Stereo Signal

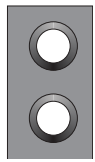
Audio CD Header Pin Definitions (CD2)

Pin Number	Definition
1	Right Stereo Signal
2	Ground
3	Left Stereo Signal
4	Ground

AC'97 Output & Audio Enable

AC'97 provides high quality onboard audio. The X6DAT-G/X6DAi-G features 6-channel sound for front L&R, rear L&R, center and subwoofer speakers. This feature is activated with the Advanced software (on the CD-ROM included with your motherboard). Sound is then output through the Line In, Line Out (JC2) and MIC jacks(JC1) (see at right). Activate AC 97 with the "AC 97 Audio" setting in the Advanced Chipset Features section of BIOS. To activate the Onboard Audio, please enable the Jumper: JPAC. See the table on right for pin definitions.

JC2



Blue: **Line In(surround sound L/R)**

Green: **Line Out(Front L/R)**

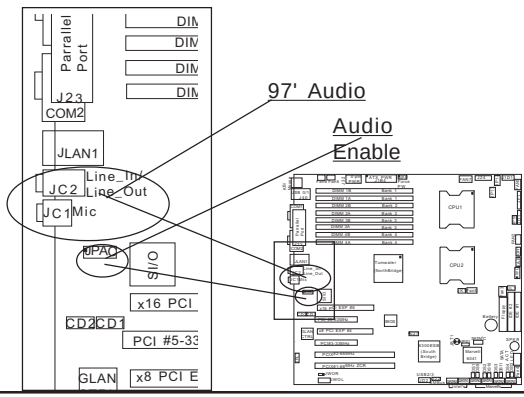
JC1

Pink: **MIC In (Center/ subwoofer)**

JPAC

AC97 Enable/Disable Jumper Settings (JPAC)

Jumper Position	Definition
1-2	Enabled
2-3	Disabled



SMB Power (I²C) Connector

I²C Connector (J24), located between the PWR ForceOn Header and the PWR Fault header, monitors the status of PWR Supply, Fan and system temperature.

SMB PWR
Pin Definitions (J24)

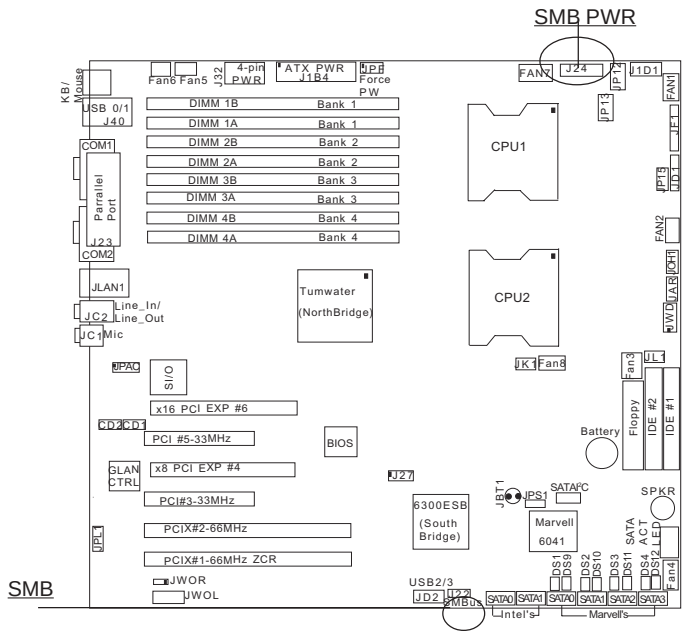
Pin #	Definition
1	Clock
2	Data
3	N/A
4	N/A
5	N/A

SMB

A System Management Bus header is located at J22. Connect the appropriate cable here to utilize SMB on your system.

SMB Header
Pin Definitions (J22)

Pin Number	Definition
1	Data
2	Ground
3	Clock
4	No Connection



SATA SMB (I²C)(*X6DAT-G only)

A Serial ATA System Management Bus header is located at JS10. Connect the appropriate cable here to utilize SATA SMB on your system.

SATA SMB (JS10) Pin Definitions

Pin Number	Definition
1	Data
2	Ground
3	Clock

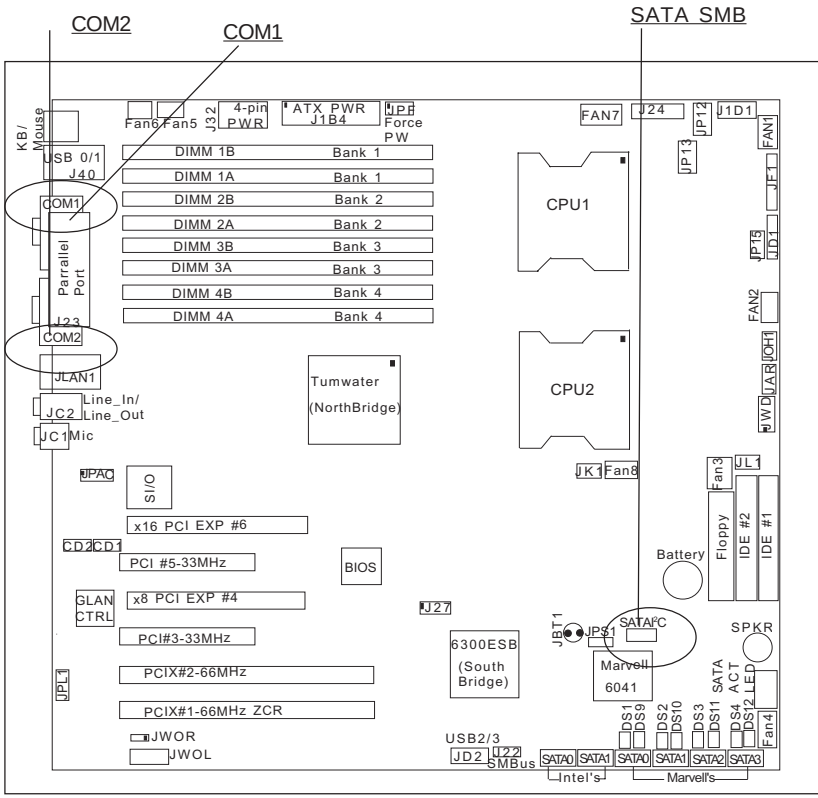
Serial Ports

The COM1 (J6) and COM2 (J38) serial ports are located under the parallel port (see Figure 2-3). See the table on the right for pin definitions.

Serial Port Pin Definitions (COM1, COM2)

Pin Number	Definition	Pin Number	Definition
1	CD	6	DSR
2	RD	7	RTS
3	TD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

Note: Pin 10 is included on the header but not on the port.

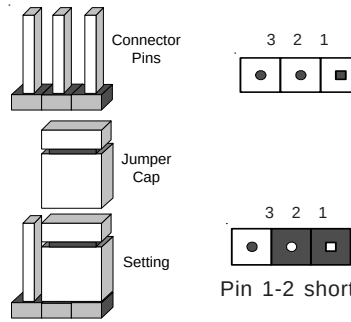


2-6 Jumper Settings

Explanation of Jumpers

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout pages for jumper locations.

Note: On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.



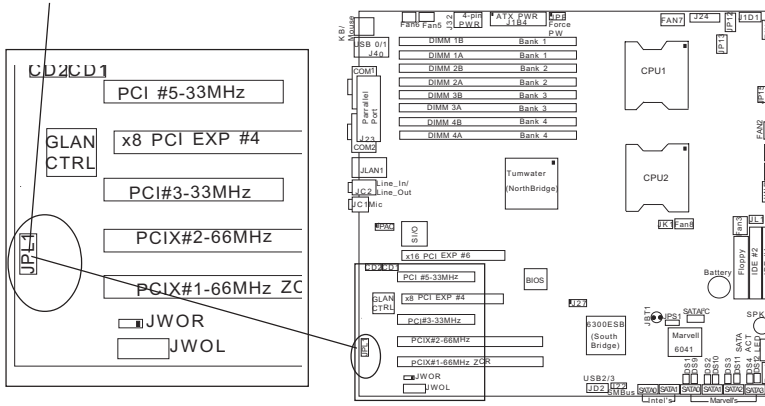
GLAN Enable/Disable

JPL1 enables or disable the GLAN port on the motherboard. See the table on the right for jumper settings. The default setting is enabled.

GLAN Enable/Disable Jumper Settings (JPL1)

Jumper Position	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

GLAN Enable



CMOS Clear

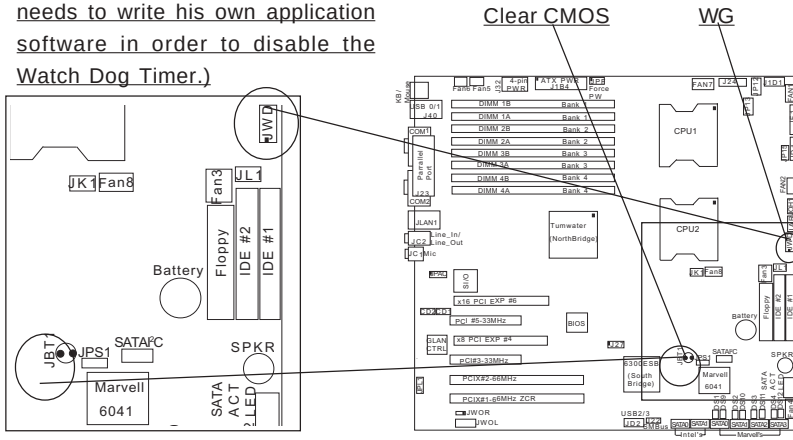
JBT1 is used to clear CMOS. Instead of pins, this "jumper" consists of contact pads to prevent the accidental clearing of CMOS. To clear CMOS, use a metal object such as a small screwdriver to touch both pads at the same time to short the connection. Always remove the AC power cord from the system before clearing CMOS. **Note:** For an ATX power supply, you must completely shut down the system, remove the AC power cord and then short JBT1 to clear CMOS. ***Do not use the PW_ON connector to clear CMOS.***

Watch Dog Enable/Disable

JWD enables the Watch Dog function. Watch Dog is a system monitor that can reboot the system when a software application is "hung up". Pins 1-2 will cause WD to reset the system if an application is "hung up". Pins 2-3 will generate a non-maskable interrupt signal for the application that is "hung up". See the table on the right for jumper settings. Watch Dog can also be enabled via BIOS. (*Note, when enabled, the user needs to write his own application software in order to disable the Watch Dog Timer.)

Watch Dog
Jumper Settings (JWD)

Jumper Position	Definition
Pins 1-2	WD to Reset
Pins 2-3	WD to NMI
Open	Disabled



Audio Enable/Disable

JPAC enables or disables the Audio Connector on the motherboard. No setting in the BIOS is used to activate onboard audio. See the table on the right for jumper settings. The default setting is enabled.

AC97 Enable/Disable Jumper Settings (JPAC)

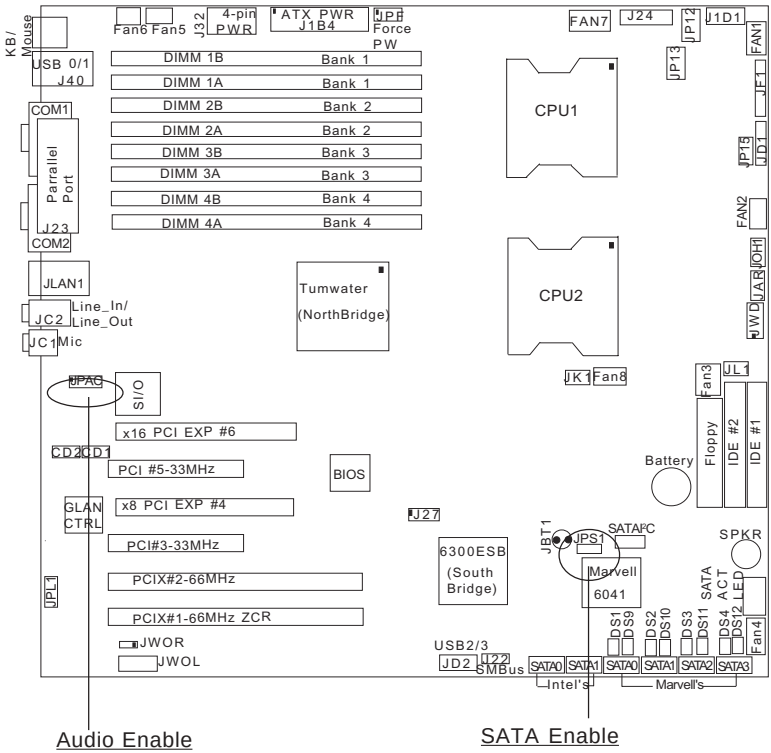
Jumper Position	Definition
1-2	Enabled
2-3	Disabled

Serial ATA Enable (*X6DAT-G Only)

JPS1 allows you to enable Marvell SATA Controller. See the table on the right for jumper definitions.

SATA Enable Jumper Settings (JPS1)

Jumper Position	Definition
1-2	Enabled
2-3	Disabled



3rd Power Supply Alarm Enable/Disable

The system can notify you in the event of the 3rd power supply failure. This feature assumes that three power supply units are installed in the chassis, with one acting as a backup. If you only have one or two power supply units installed, you should disable this (the default setting) with JP13 to prevent false alarms. See the table on right for pin definitions.

3rd Power Supply Alarm Enable Jumper Settings (JP13)

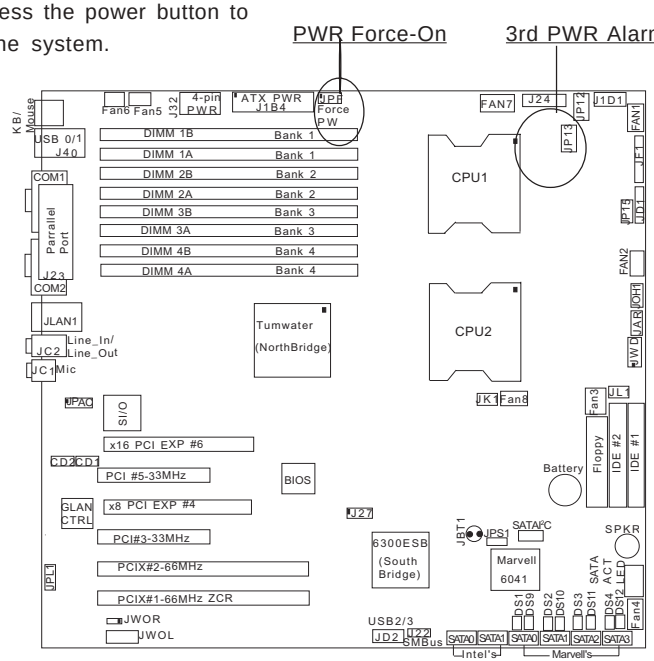
Jumper Position	Definition
Open	Enabled
Closed	Disabled

Force-Power-On Enable/ Disable

Jumper JPF allows you to enable or disable the function of Force-Power-On. If enabled, the power will always stay on automatically. If this function disabled, the user needs to press the power button to power on the system.

Force Power On (JPF)

Jumper Position	Definition
Open	Normal
Closed	Force On



Reboot Option Enable (*For Debug only)

Enabling the reboot option with JP15 will cause the system to reboot after a timeout if the system hangs on bootup. See the table on the right for pin definitions. The default setting is enabled.

Reboot Option Enable Jumper Settings (JP15)

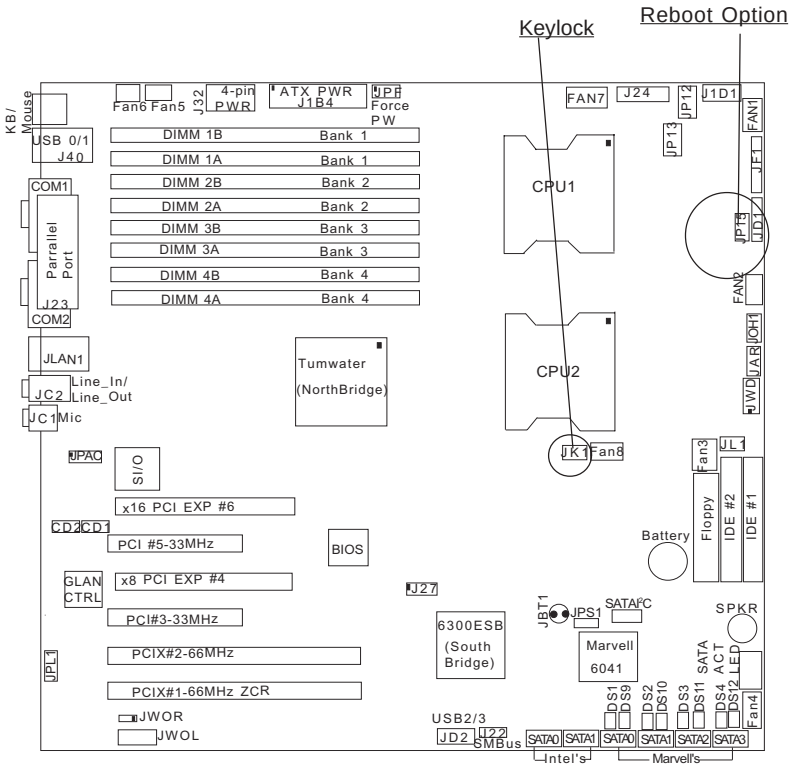
Jumper Position	Definition
Open	Enabled
Closed	Disabled

Keylock

The keyboard lock connection is located on JK1. Utilizing this header allows you to inhibit any actions made on the keyboard, effectively "locking" it.

Keylock (JK1)

Jumper Position	Definition
1	Ground
2	Keylock R-N



2-7 Onboard Indicators

GLAN LEDs

The Gigabit Ethernet LAN ports has two LEDs. The yellow LED indicates activity while the other LED may be green, orange or off to indicate the speed of the connection. See the table at right for the functions associated with the second LED.

1 Gb LAN Right LED Indicator (Speed LED)

LED Color	Definition
Off	No Connection
Green	10/100 MHz
Amber	1 GHz

1 Gb LAN Left LED Indicator(Activity LED)

LED Color	Definition
Amber	Blinking 10/100MHz/ 1GHz

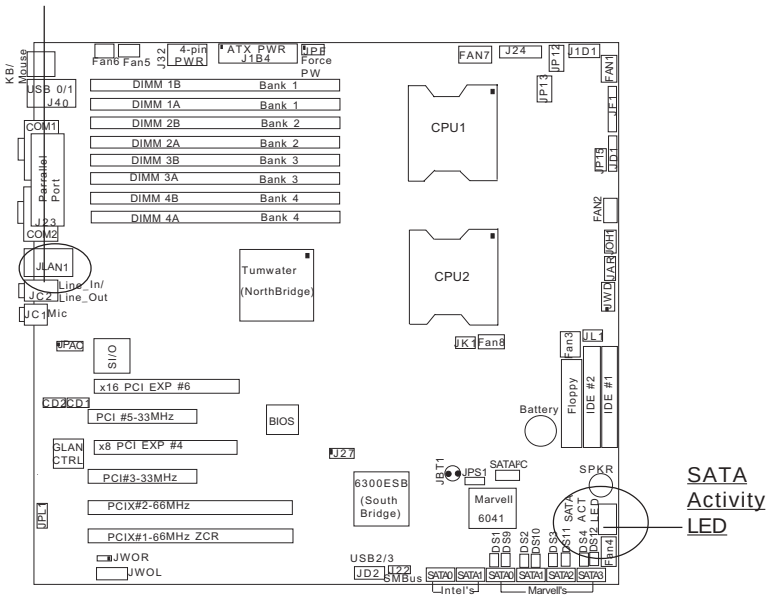
SATA Activity LED (*X6DAT-G Only)

A Serial ATA Activity LED header is located at JS9. See the table on the right for speaker pin definitions.

SATA Activity LED(JS9)

Pin#	Definition
1	Marvell SATA HD0 Active LED
2	Marvell SATA HD1 Active LED
3	Marvell SATA HD2 Active LED
4	Marvell SATA HD3 Active LED
5	COMMON
6	NC
7	NC
8	NC
9	NC

GLAN LED



Pre-LED Indicators

There are four Pre-LEDs (DS1, DS2, DS3, DS4)on the motherboard. A Pre-LED will stay on to indicate the presence of a hard drive. See the table on the right for the pin definitions.

Pre-LED Indicators (DS1, DS2, DS3, DS4)

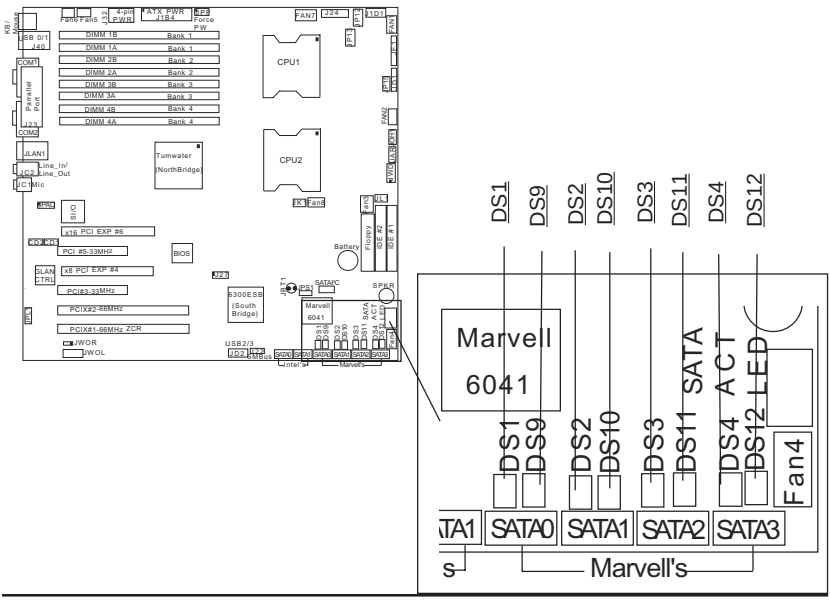
No.	State	Definition
DS1 DS2 DS3 DS4	Stay On	HDD Present

Activity LED Indicators

Four Activity LED Indicators (DS9, DS10, DS11, DS12) are located on the motherboard to indicate the activity status of Hard Drives. Refer to the table on the right for detailed information.

Activity LED Indicators (DS9, DS10, DS11, DS12)

No.	State	Definition
DS9 DS10 DS11 DS12	Blinking	HDD Active



2-8 Parallel Port, Floppy/ and Hard Disk Drive Connections

Note the following when connecting the floppy and hard disk drive cables:

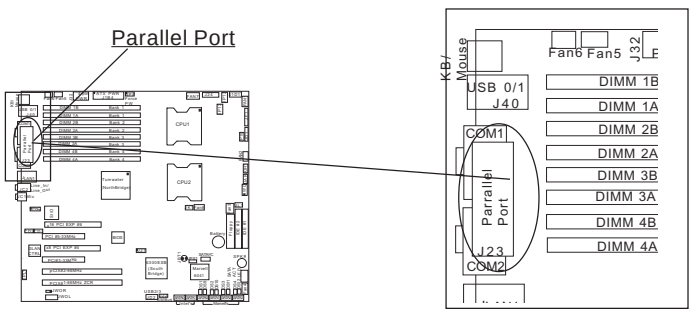
- The floppy disk drive cable has seven twisted wires.
- A red mark on a wire typically designates the location of pin 1.
- A single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always connects to drive A, and the connector that does not have twisted wires always connects to drive B.

Parallel (Printer) Port Connector

The parallel (printer) port is located on J23. See the table on the right for pin definitions.

Parallel (Printer) Port Pin Definitions (J23)

Pin Number	Function	Pin Number	Function
1	Strobe-	2	Auto Feed-
3	Data Bit 0	4	Error-
5	Data Bit 1	6	Init-
7	Data Bit 2	8	SLCT IN-
9	Data Bit 3	10	GND
11	Data Bit 4	12	GND
13	Data Bit 5	14	GND
15	Data Bit 6	16	GND
17	Data Bit 7	18	GND
19	ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	NC



Floppy Connector

The floppy connector is located on JP8. See the table below for pin definitions.

Floppy Connector Pin Definitions (J8)

Pin Number	Function	Pin Number	Function
1	GND	2	FDHDIN
3	GND	4	Reserved
5	Key	6	FDEDIN
7	GND	8	Index-
9	GND	10	Motor Enable
11	GND	12	Drive Select B-
13	GND	14	Drive Select A-
15	GND	16	Motor Enable
17	GND	18	DIR-
19	GND	20	STEP-
21	GND	22	Write Data-
23	GND	24	Write Gate-
25	GND	26	Track 00-
27	GND	28	Write Protect-
29	GND	30	Read Data-
31	GND	32	Side 1 Select-
33	GND	34	Diskette

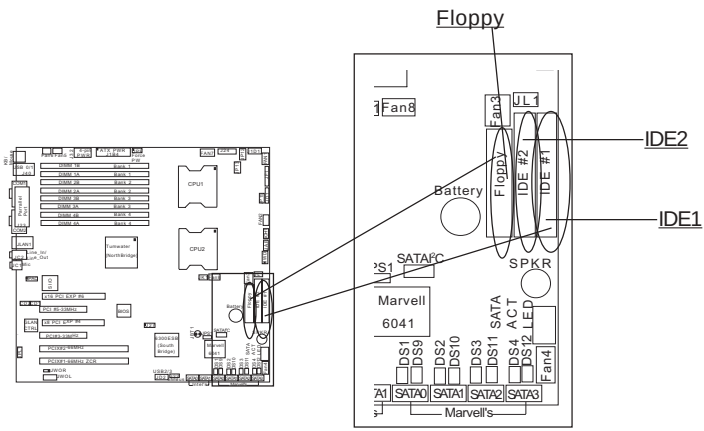
IDE Connectors

There are no jumpers to configure the onboard IDE#1 and #2 connectors (at J3 and J4, respectively). See the table on the right for pin definitions.

(*For Software Drivers, SATA HostRAID Utility and the OS installation instructions, please refer to Appendix B.)

IDE Connector Pin Definitions (J3 J4)

Pin Number	Function	Pin Number	Function
1	Reset IDE	2	GND
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	GND	20	Key
21	DRQ3	22	GND
23	I/O Write-	24	GND
25	I/O Read-	26	GND
27	IOCHRDY	28	BALE
29	DACK3-	30	GND
31	IRQ14	32	IOCS16-
33	Addr 1	34	GND
35	Addr 0	36	Addr 2
37	Chip Select 0	38	Chip Select 1-
39	Activity	40	GND



Chapter 3

Troubleshooting

3-1 Troubleshooting Procedures

Use the following procedures to troubleshoot your system. If you have followed all of the procedures below and still need assistance, refer to the 'Technical Support Procedures' and/or 'Returning Merchandise for Service' section(s) in this chapter.

Note: Always disconnect the power cord before adding, changing or installing any hardware components.

Before Power On

1. Make sure that no short circuits exist between the motherboard and chassis.
2. Disconnect all ribbon/wire cables from the motherboard, including those for the keyboard and mouse.
3. Remove all add-on cards.
4. Install one CPU and make sure that it is fully seated. Connect the chassis speaker and the power LED to the motherboard. (Check all jumper settings as well.)
5. Use only the correct type of onboard CMOS battery as recommended by the Manufacturer. Do not install the onboard battery upside down to avoid possible explosion.

No Power

1. Make sure that no short circuits exist between the motherboard and the chassis.
2. Verify that all jumpers are set to their default positions.
3. Check that the 115V/240V switch on the power supply is properly set.
4. Turn the power switch on and off to test the system.
5. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

No Video

1. If the power is on but you have no video, remove all the add-on cards and cables.
2. Use the speaker to determine if any beep codes exist. Refer to the Appendix for details on beep codes.

NOTE

If you are a system integrator, VAR or OEM, a POST diagnostics card is recommended. For I/O port 80h codes, refer to App. B.

Memory Errors

1. Make sure that the DIMM modules are properly and fully installed.
2. Determine if different speeds of DIMMs have been installed and verify that the BIOS setup is configured for the fastest speed of RAM used. It is recommended to use the same RAM speed for all DIMMs in the system.
3. Make sure that you are using the correct type of ECC registered DDR333/266 (PC2700/2100) SDRAM (*recommended by the manufacturer.) (*Please refer to Chapter 2 for DDR memory support.)
4. Check for bad DIMM modules or slots by swapping a single module between two slots and noting the results.
5. Make sure all memory modules are fully seated in their slots. An interleaved memory scheme is used, so you must install two modules of same type and of same speed at a time, beginning with DIMM #1A, then DIMM #1B, and so on (see Section 2-3).
6. Check the position of the 115V/240V switch on the power supply.

Losing the System's Setup Configuration

1. Make sure that you are using a high quality power supply. A poor quality power supply may cause the system to lose the CMOS setup information. Refer to Section 1-6 for details on recommended power supplies.
2. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.
3. If the above steps do not fix the Setup Configuration problem, contact your vendor for repairs.

3-2 Technical Support Procedures

Before contacting Technical Support, please take the following steps. Also, note that as a motherboard manufacturer, Super Micro does not sell directly to end-users, so it is best to first check with your distributor or reseller for troubleshooting services. They should know of any possible problem(s) with the specific system configuration that was sold to you.

1. Please go through the 'Troubleshooting Procedures' and 'Frequently Asked Question' (FAQ) sections in this chapter or see the FAQs on our web site (http://www.supermicro.com/support/faqs/) before contacting Technical Support.
2. BIOS upgrades can be downloaded from our web site at (http://www.supermicro.com/support/bios/).

Note: Not all BIOS can be flashed depending on the modifications to the boot block code.

3. If you still cannot resolve the problem, include the following information when contacting Supermicro for technical support:
   - Motherboard model and PCB revision number
   - BIOS release date/version (this can be seen on the initial display when your system first boots up)
   - System configuration

   An example of a Technical Support form is on our web site at (http://www.supermicro.com/support/contact.cfm).
4. Distributors: For immediate assistance, please have your account number ready when placing a call to our technical support department. We can be reached by e-mail at support@supermicro.com, by phone at: (408) 503-8000, option 2, or by fax at (408)503-8019.

3-3 Frequently Asked Questions

Question: What are the various types of memory that my motherboard can support?

Answer: The X6DAT-G/X6DAi-8 has eight 184-pin DIMM slots that support ECC registered ECC DDR333/266 (PC2700/2100) SDRAM modules. It is strongly recommended that you do not mix memory modules of different speeds and sizes. Please refer to Chapter 2 for instructions on memory support.

Question: How do I update my BIOS?

Answer: It is recommended that you **do not** upgrade your BIOS if you are experiencing no problems with your system. Updated BIOS files are located on our web site at http://www.supermicro.com. Please check our BIOS warning message and the information on how to update your BIOS on our web site. Also, check the current BIOS revision and make sure it is newer

than your BIOS before downloading.

Note: There is no BIOS recovery function available for the motherboard. Should a problem occur after you flash the BIOS, you will need to change the BIOS chip.

Question: What's on the CD that came with my motherboard?

Answer: The supplied compact disc has quite a few drivers and programs that will greatly enhance your system. We recommend that you review the CD and install the applications you need. Applications on the CD include chipset drivers for Windows and security and audio drivers.

3-4 Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

This warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alternation, misuse, abuse or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

Chapter 4
Phoenix BIOS

4-1 Introduction

This chapter describes the Phoenix BIOS™ Setup utility for the X6DAT-G/X6DAi-G. The Phoenix ROM BIOS is stored in a flash chip and can be easily upgraded using a floppy disk-based program.

Note: Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Please refer to the Manual Download area of the Supermicro web site <http://www.supermicro.com/support/resources/> for any changes to the BIOS that may not be reflected in this manual.

System BIOS

The BIOS is the Basic Input Output System used in all IBM® PC, XT™, AT®, and PS/2® compatible computers. The Phoenix BIOS flash chip stores the system parameters, such type of disk drives, video displays, etc. in the CMOS. The CMOS memory requires very little electrical power. When the computer is turned off, a back-up battery provides power to the CMOS Memory in RTC logic, enabling it to retain system parameters. Each time the computer is powered-on, the computer is configured with the values stored in the CMOS Memory by the system BIOS, which gains control at boot-up.

How To Change the Configuration Data

The CMOS information that determines the system parameters may be changed by entering the BIOS Setup utility. This Setup utility can be accessed by pressing the <Delete> key at the appropriate time during system boot, see below.

Starting the Setup Utility

Normally, the only visible POST (Power On Self Test) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the BIOS Setup utility. From the main menu, you can access the other setup screens, such as the Security and Power menus. Beginning with Section 4-3, detailed descriptions are given for each parameter setting in the Setup utility.

4-2 Running Setup

Default settings are in bold text unless otherwise noted.

The BIOS setup options described in this section are selected by choosing the appropriate text from the main BIOS Setup screen. All displayed text is described in this section, although the screen display is often all you need to understand how to set the options (see on next page).

When you first power on the computer, the Phoenix BIOS™ is immediately activated.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing <Delete> immediately after turning the video on, or
2. When the message shown below appears briefly at the bottom of the screen during the POST (Power On Self-Test), press the <Delete> key to activate the main Setup menu:

Press the <Delete> key to enter Setup

4-3 Main BIOS Setup

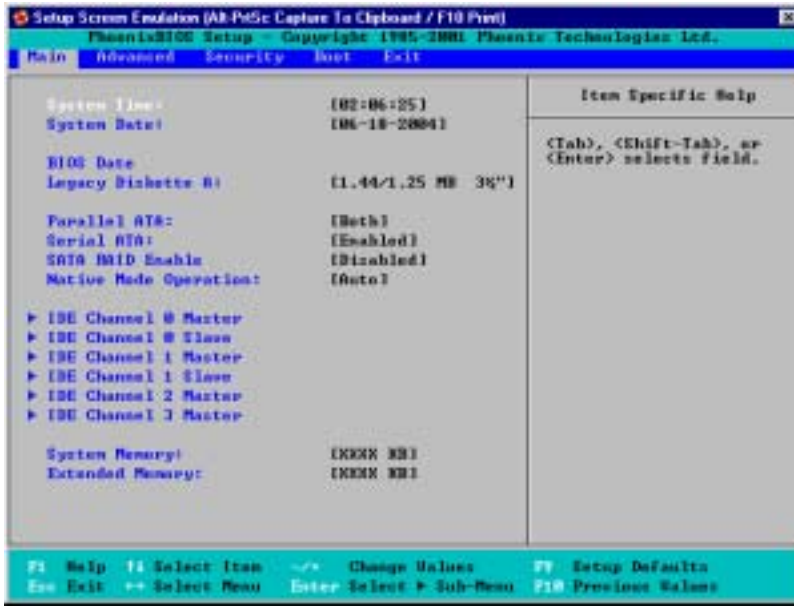
All main Setup options are described in this section. The main BIOS Setup screen is displayed below.

Use the Up/Down arrow keys to move among the different settings in each menu. Use the Left/Right arrow keys to move among different setup screens. Press<+>/<-> keys to change the value of a setting.

Press the <Esc> key to exit the CMOS Setup Menu. The next section describes in detail how to navigate through the menus.

Items that use submenus are indicated with the ▶ icon. With the item highlighted, press the <Enter> key to access the submenu.

Main BIOS Setup Menu


Setup Screen Emulation (Alt-PrtSc Capture To Clipboard / F10 Print)
PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Main Advanced Security Boot Exit
System Time: [02:06:25]
System Date: [06-18-2004]
BIOS Date
Legacy Diskette A: [1.44/1.25 MB 3½"]
Parallel ATA: [Both]
Serial ATA: [Enabled]
SATA RAID Enable [Disabled]
Native Mode Operation: [Auto]
IDE Channel 0 Master
IDE Channel 0 Slave
IDE Channel 1 Master
IDE Channel 1 Slave
IDE Channel 2 Master
IDE Channel 3 Master
System Memory: [XXXX KB]
Extended Memory: [XXXX KB]
Item Specific Help
<Tab>, <Shift-Tab>, or <Enter> selects field.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Main Setup Features

System Time

To set the system date and time, key in the correct information in the appropriate fields, or use "-" and "+" to change the Hour, Minute and Second fields.

System Date

Use the arrow keys to highlight the month, day and year fields and enter the correct data.

BIOS Date

This section allows the BIOS to automatically display the BIOS date code. The BIOS date code is used to identify the BIOS release date/release version.

Legacy Diskette A

This setting allows the user to set the type of floppy disk drive installed as diskette A. The options are Disabled, 360Kb 5.25 in, 1.2MB 5.25 in, 720Kb 3.5 in, **1.44/1.25MB**, 3.5 in and 2.88MB 3.5 in.

Parallel ATA

This setting allows the user to choose the function of IDE channels. The options are Disabled, Channel 0, Channel 1 and **Both.**

Serial ATA

This setting allows the user to enable or disable the function of Serial ATA. The options are Disabled and **Enabled.**

Serial ATA RAID Enable

Select Enable to enable Serial ATA RAID Functions. (*For the Windows OS environment, use the RAID driver if this feature is set to Enabled. If **Disabled**, use the "Non-RAID" driver.)

Native Mode Operation

This option allows the user to select Native Mode for ATA. If enabled, Native Mode allows the OS much more flexibility in assigning resources, reducing the occurrences of component incomparability in the system. Some Operating Systems are not supported by Native Mode. The options are: Serial ATA, Parallel ATA, **Auto**, and Both.

▶IDE Channel 0 Master/Slave, IDE Channel 1 Master/Slave, IDE Channel 2 Master, IDE Channel 3 Master

These settings allow the user to set the parameters of IDE Channel 0 Master/Slave, IDE Channel 1 Master/Slave, IDE Channel 2 Master, IDE Channel 3 Master slots. Hit <Enter> to activate the following sub-menu screen for detailed options of these items. Set the correct configurations accordingly. The items included in the sub-menu are:

PhoenixBIOS Setup - Copyright 1985-2001 Phoenix Technologies Ltd.
Main
Item Specific Help
Multi-Sector Transfers: [Disabled]
LBA Mode Control: [Disabled]
32 Bit I/O: [Disabled]
Transfer Mode: [Standard]
Ultra DMA Mode: [Disabled]
User - you enter parameters of hard-disk drive installed at this connection.
Auto - autotypes hard-disk drive installed here.
1-39 - you select pre-determined type of hard-disk drive installed here.
CD-ROM - a CD-ROM drive is installed here.
ATAPI Removable - removable disk drive is installed here.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Type

This feature allows the user to select the type of IDE hard drives. The option- "User" will allow the user to enter the parameters of the HDD installed at this connection. The option-"Auto" will allow the BIOS to automatically configure the parameters of the HDD installed at the connection. Choose the option"1-39" to select a pre-determined HDD type. Select CD-ROM if a CD-ROM drive is installed. Select ATAPI if a removable disk drive is installed.

Multi-Sector Transfers

This feature allows the user to select the number of transfer sectors. The options are Disabled, 2, 4, 6, 8 and **16 Sectors**.

LBA Mode (Large Block Access) Control

Select **Enabled** to allows the Phoenix BIOS to access the IDE Channel 0 Master Device via LBA mode. The options are Disabled and **Enabled**.

32 Bit I/O

This option allows the user to enable or disable the function of 32-bit data transfer. The options are Enabled and **Disabled**.

Transfer Mode

This feature allows the user to select transfer mode. The options are **Standard**, Fast PIO1, Fast PIO2, Fast PIO3, Fast PIO4, FPIO3/DMA1 and FPIO4/DMA2.

Ultra DMA (Direct Memory Access) Mode

This feature allows the user to select Ultra DMA Modes. DMA Modes allow peripheral devices (such as sound cards, floppy disks) transfer data directly to and from memory without going through the CPU. With double transition clocking, UDMA (Ultra DMA) allows data to be transferred on both the rising and the falling edges of the clock, doubling data throughput for any given clock speed. The options are Disabled, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4, and Mode 5. Please refer to the table below for detailed information.

Ultra DMA Mode	Cycle Time (Nanoseconds)	
Mode 0	240	
Mode 1	160	
Mode 2	120	
Mode 3	90	
Mode 4	60	
Mode 5	40	

System Memory

This display informs you how much system memory is recognized as being present in the system.

Extended Memory

This display informs you how much extended memory is recognized as being present in the system.

4-4 Advanced Setup

Choose Advanced from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. The items with a triangle beside them have sub menus that can be accessed by highlighting the item and pressing <Enter>. Options for PIR settings are displayed by highlighting the setting option using the arrow keys and pressing <Enter>. All Advanced BIOS Setup options are described in this section.

▶Boot Features

Access the submenu to make changes to the following settings.

Quick Boot Mode

If enabled, this feature will speed up the POST (Power On Self Test) routine by skipping certain tests after the computer is turned on. The settings are **Enabled** and Disabled. If Disabled, the POST routine will run at normal speed.

Quiet Boot

This setting allows you to **Enable** or Disable the OEM Logo screen during boot-up.

ACPI Mode

Use the setting to determine if you want to employ ACPI (Advanced Configuration and Power Interface) power management on your system. The options are **Yes** and No.

ACPI Sleep Mode

This feature allows the user to select the sleep mode for ACPI. The options are **S1(-Stanby)** and S3 (-Suspend to RAM).

Power Button Behavior

This setting allows you to choose how the system powers down when the user presses the power button. Select Instant-Off to power off the system as soon as the power button is pressed. Select 4-sec override to allow the system to wait for 4 seconds before power-off when the power button is pressed. The options are **Instant-Off** and 4-sec override.

Keyboard on Now Function

This option allows you to select how the system may be resumed from the S3-S5 state. The options are **Space** (by pressing the space bar), and Password (by entering a password.)

Power Loss Control

This setting allows you to choose how the system will react when power returns after an unexpected loss of power. The options are Stay Off, Power On and **Last State**.

Watch Dog

This feature allows the user to enable or disable the Watch Dog feature. The options are Enabled and **Disabled**. (Please refer to Chapter 2 for more information.)

Summary Screen

This setting allows you to **Enable** or Disable the summary screen which displays the system configuration during bootup.

▶Memory Cache

Cache System BIOS Area

This setting allows you to designate a reserve area in the system memory to be used as a System BIOS buffer to allow the BIOS to write (cache) its data into this reserve memory area. Select "**Write Protect**"

to enable this function, and the area designated will be reserved for the BIOS ROM access only. Select "Uncached" to disable this function and make this area available for other devices.

Cache Video BIOS Area

This setting allows you to designate a reserve area in the system memory to be used as a Video BIOS buffer to allow the BIOS to write (cache) its data into this reserved memory area. Select "**Write Protect**" to enable the function, and this area will be reserved for the BIOS ROM access only. Select "Uncached" to disable this function and make this area available for other devices.

Cache Base 0-512K

If enabled, this feature will allow the data stored in the base memory area: block 0-512K to be cached (written) into an area in the Static DRAM or written into L1, L2, L3 cache inside the CPU to speed up CPU operation. Select "Uncached" to disable this function. Select "Write Through" to allow data to be cached into the buffer and be written into the system memory at the same time. Select "Write Protect" to prevent data from being written into the base memory area of Block 0-512K. Select "Write Back" to allow the CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are "Uncached", "Write Through", "Write Protect", and **"Write Back"**.

Cache Base 512K-640K

If enabled, this feature will allow the data stored in the memory area: 512K-640K to be cached (written) into an area in the Static DRAM or be written into L1, L2, L3 cache inside the CPU to speed up CPU operation. Select "Uncached" to disable this function. Select "Write Through" to allow data to be cached into the buffer and written into the system memory at the same time. Select "Write Protect" to prevent data from being written into the base memory area of Block 512-640K. Select "Write Back" to allow CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are "Uncached", "Write Through", "Write Protect", and **"Write Back"**.

Cache Extended Memory

If enabled, this feature will allow the data stored in the extended memory area to be cached (written) into an area in the Static DRAM or written into L1, L2, L3 cache inside the CPU to speed up CPU operation. Select "Uncached" to disable this function. Select "Write Through" to allow data to be cached into the buffer and be written into the system memory at the same time. Select "Write Protect" to prevent data from being written into the memory area above 1 MB . Select "Write Back" to allow CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are "Uncached", "Write Through", "Write Protect", and **"Write Back"**.

▶PCI Configuration

Access the submenu to make changes to the following settings for PCI devices.

Onboard GLAN (Gigabit- LAN) OPROM Configure

Enable the bootable firmware-Option ROM (OPROM) on GLAN to allow the user to boot the system from GLAN. The options are Enabled and **Disabled**.

Reset Configuration Data

If set to Yes, this setting clears the Extended System Configuration Data-(ESCD) area. The options are Yes and **No**.

PCIX 66MHz ZCR Slot#1/PCIX 66MHz Slot#2/PCI 33MHz Slot#3/ PCI Express x8 Slot#4/PCI 33MHz Slot#5/PCI Express x16 Slot6

Access the submenu for each of the settings above to make changes to the following:

Option ROM Scan

When enabled, this setting will initialize the device expansion ROM. The options are **Enabled** and Disabled.

Enable Master

This setting allows you to enable the selected device as the PCI bus master. The options are **Enabled** and Disabled.

Latency Timer

This setting allows you to set the clock rate for Bus Master. A high-priority, high-throughout device may benefit from a greater Clock rate. The options are **Default**, 0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, and 00E0h. For Unix, Novell and other Operating Systems, please select the option: "other". If a drive fails after the installation of a new software , you might want to change this setting and try again. Different OS requires different Bus Master clock rate**.**

Large Disk Access Mode

This setting determines how large hard drives are to be accessed. The options are **DOS** or Other (for Unix, Novelle NetWare and other operating systems).

▶Advanced Chipset Control

Access the submenu to make changes to the following settings.

Force Compliance Mode

If enabled, this feature sets the device specified to comply with the PCI-Express Compliance 1.0 Mode. The options are: **Disabled** and Enabled.

Memory RAS Feature Control

Select this option to enable Memory RAS (Reliability/Availability/ Serviceability) Feature Control. The options are **Standard**, Sparing and Mirroring. Select Sparing (RAID0) to increase the performance of data transfer by simultaneously writing data to two memory modules. Select Mirroring (RAID 1) to protect data from a disk failure by writing identical data on two memory modules.

Clock Spectrum Feature

If "Enabled", the Phoenix BIOS will detect and attempt to reduce the Electromagnetic Interference caused by the components. The options are Enabled and **Disabled**.

DRAM Data Integrity Mode

If enabled, this feature allows the data stored in the DRAM memory to be ECC (Error Checking & Correction) compliant . The options are 72-bit ECC, 144-bit ECC, **Auto** and Disabled.

ECC Error Type

This setting lets you select which type of interrupt to be activated as a result of an ECC error. The options are **None**, NMI (Non-Maskable Interrupt), SMI (System Management Interrupt) and SCI (System Control Interrupt.)

SERR (System Error) Signal Condition

This setting specifies the conditions required to be qualified as an ECC error. The options are None, **Single Bit**, Multiple Bit and Both.

USB Device 29, Function 2 & 3

This setting allows you to **Enable** or Disable all functions for the USB devices specified.

Legacy USB Support

This setting allows you to enable support for Legacy USB devices. The settings are **Enabled** and Disabled.

▶Advanced Processor Options

Access the submenu to make changes to the following settings.

CPU Speed

This is a display that indicates the speed of the installed processor.

Hyper Threading

This setting allows you to **Enable** or Disable the function of Hyper Threading. Enabling hyper-threading results in increased CPU performance.

Machine Checking

This setting allows you to Enable or **Disable** Machine Checking. If "Enabled", the OS will debug the system during system reset after a system crash.

Adjacent Cache Line Prefetch

The CPU fetches the cache line for 64 bytes if Disabled. The CPU fetches both cache lines for 128 bytes as comprised if **Enabled**.

▶I/O Device Configuration

Access the submenu to make changes to the following settings:

KBC Clock input

This setting allows you to set the clock frequency for the Keyboard Clock. The options are 6MHz, 8MHz, and **12 MHz**.

Onboard COM1

This setting allows you to assign control of Onboard COM1. The options are **Enabled** (user defined), Disabled, Auto (BIOS controlled) and OS Controlled.

Base I/O Address

This feature allows the user to select the base I/O address for Onboard COM1. The options are **3F8**, 2F8, 3E8 and 2E8.

Interrupt

This feature allows the user to select the IRQ (interrupt request) for Onboard COM1. The options are IRQ3 and **IRQ4**.

Onboard COM2

This setting allows you to assign control of Onboard COM2. The options are **Enabled** (user defined), Disabled, Auto (BIOS controlled) and OS Controlled.

Mode

This feature allows the user to specify the type of device that will be connected to Onboard COM2. The options are **Normal**, IR (for an infrared device) and ASK-IR.

Base I/O Address

This feature allows the user to select the base I/O address for Onboard COM2. The options are 3F8, **2F8**, 3E8 and 2E8.

Interrupt

This feature allows the user to select the IRQ (interrupt request) for Onboard COM2. The options are **IRQ3** and IRQ4.

Parallel Port

This setting allows you to assign control of the parallel port. The options are **Enabled** (user defined), Disabled and Auto (BIOS controlled).

Base I/O Address

This feature allows the user to select the base I/O address for the parallel port. The options are **378**, 278 and 3BC.

Interrupt

This feature allows the user to select the IRQ (interrupt request) for the parallel port. The options are IRQ5 and **IRQ7**.

Mode

This feature allows the user to specify the parallel port mode. The options are Output, Bi-directional, **ECP** and EPP.

DMA Channel

This feature allows the user to specify the DMA channel. The options are DMA1 and **DMA3**.

Floppy Disk Controller

This setting allows you to assign control of the floppy disk controller. The options are **Enabled** (user defined), Disabled, Auto (BIOS controlled) and OS Controlled.

Base I/O Address

This feature allows the user to select the base I/O address for the Floppy port. The options are **Primary** and Secondary.

▶DMI Event Logging

Access the submenu to make changes to the following settings.

Event Log Validity

This is a display, not a setting, informing you of the event log validity.

Event Log Capacity

This is a display, not a setting, informing you of the event log capacity.

View DMI Event Log

Highlight this item and press <Enter> to view the contents of the event log.

Event Logging

This setting allows you to **Enable** or Disable event logging.

ECC Event Logging

This setting allows you to **Enable** or Disable ECC event logging.

Mark DMI Events as Read

Highlight this item and press <Enter> to mark the DMI events as read.

Clear All DMI Event Logs

Select Yes and press <Enter> to clear all DMI event logs.

▶Console Redirection

Access the submenu to make changes to the following settings.

COM Port Address

This feature allows the user to specify whether to redirect the console to On-board COM A or On-board COM B. This setting can also be **Disabled**.

BAUD Rate

This feature allows the user to select the BAUD rate for console redirection. The options are 300, 1200, 2400, 9600, **19.2K**, 38.4K, 57.6K and 115.2K.

Console Type

This feature allows the user to choose from the available options to select the console type for console redirection. The options are VT100, VT100,8bit, PC-ANSI, 7bit, **PC ANSI**, VT100+, VT-UTF8.

Flow Control

This feature allows the user to choose from the available options to select the flow control for console redirection. The options are: None, XON/XOFF, and **CTS/RTS**.

Console Connection

This feature allows the user to select the method of console connection: either **Direct** or Via Modem.

Continue CR after POST

This feature allows the user to decide whether to continue with console redirection after the POST routine. The options are On and **Off**.

▶Hardware Monitor Logic

CPU Temperature Threshold

This option allows the user to set a CPU temperature threshold that will activate the alarm system when the CPU temperature reaches this pre-set temperature threshold. The options are 85ºC, **90ºC**, 95ºC and 100ºC.

Highlight this and hit <Enter> to see monitor data for the following items:

CPU1 Temperature: This item displays CPU1 Temperature.

CPU2 Temperature: This item displays CPU2 Temperature.

System Temperature: This item displays the system Temperature.

Fan Speed Control Modes:

This feature allows the user to decide how the system controls the speeds of the onboard fans. If the option is set to "3-pin Server", the fan speed is controlled by the CPU temperature. When the CPU temperature is higher, the fan speed will be higher as well. If this option is set to "4-pin", the onboard fan speeds are controlled by Thermal Management via PWM. If set to "Disable," the fan speed control is disabled and the onboard fan will run at the full speed (12V) at all time. Select 3-pin if your chassis came with 3-pin fan headers. Select 4-pin if your chassis came with 4-pin fan headers. Select Server if your system is used as a server. Select Workstation if your system is used a Workstation. The Options are: **"Disable"**, "3-pin Server", "3-pin Workstation", "4-pin Server" and "4-pin Workstation".

Fan1 Speed to Fan8 Speed

Power Voltages:

Vcore A

Vcore B

P3V3

P5V

N12V

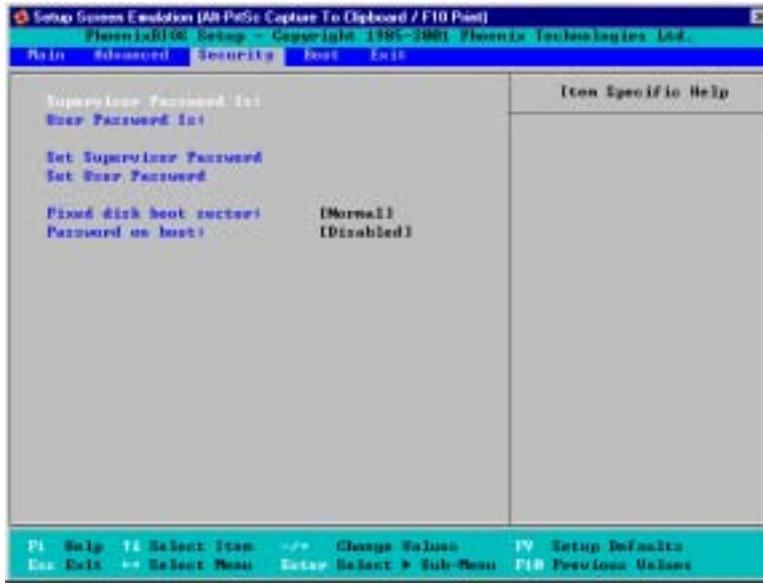
P12V

VDD

P5Vsb

4-5 Security

Choose Security from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. Security setting options are displayed by highlighting the setting using the arrow keys and pressing <Enter>. All Security BIOS settings are described in this section.



Supervisor Password Is:

This feature allows the BIOS to show whether a supervisor password has been entered for the system. Clear means such a password has not been used and Set means a supervisor password has been entered for the system.

User Password Is:

This feature allows the BIOS to show whether a user password has been entered for the system. Clear means such a password has not been used and Set means a user password has been entered for the system.

Set Supervisor Password

When the item "Set Supervisor Password" is highlighted, hit the <Enter> key. When prompted, type the Supervisor's password in the dialogue box to set or to change supervisor's password, which allows access to the BIOS.

Set User Password

When the item "Set User Password" is highlighted, hit the <Enter> key. When prompted, type the user's password in the dialogue box to set or to change the user's password, which allows access to the system at boot-up.

Fixed Disk Boot Sector

This setting may offer some protection against viruses when set to Write Protect, which protects the boot sector on the hard drive from having a virus written to it. The other option is **Normal**.

Password on Boot

This setting allows you to specify that a password is needed during system boot up. The options are Enabled (password required) and Disabled (password not required).

4-6 Boot

Choose Boot from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. Highlighting a setting with a + or - will expand or collapse that entry. See details on how to change the order and specifications of boot devices in the Item Specific Help window. All Boot BIOS settings are described in this section.

PhoenixBIOS Setup – Copyright 1985-2001 Phoenix Technologies Ltd.
Main Advanced Security Boot Exit
+Removable Devices
CD-ROM Drive
+Hard Drive
Item Specific Help
<Tab>, <Shift-Tab>, or <Enter> selects field.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

+Removable Devices

Highlight and press <Enter> to expand the field. See details on how to change the order and specs of devices in the Item Specific Help window.

CD-ROM Drive

See details on how to change the order and specs of the CD-ROM drive in the Item Specific Help window.

+Hard Drive

Highlight and press <Enter> to expand the field. See details on how to change the order and specs of hard drives in the Item Specific Help window.

4-7 Exit

Choose Exit from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. All Exit BIOS settings are described in this section.

Setup Screen Emulation [Alt-PrtSc Capture To Clipboard / F10 Print]
PhoenixBIOS Setup - Copyright 1985-2001 Phoenix Technologies Ltd.
Main Advanced Security Boot Exit
Exit Saving Changes
Exit Discarding Changes
Load Setup Defaults
Discard Changes
Save Changes
Item Specific Help
Exit System Setup and save your changes to CMOS.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Exit Saving Changes

Highlight this item and hit <Enter> to save any changes you've made and to exit the BIOS Setup utility.

Exit Discarding Changes

Highlight this item and hit <Enter> to exit the BIOS Setup utility without saving any changes you may have made.

Load Setup Defaults

Highlight this item and hit <Enter> to load the default settings for all items in the BIOS Setup. These are the safest settings to use.

Discard Changes

Highlight this item and hit <Enter> to discard (cancel) any changes you've made. You will remain in the Setup utility.

Save Changes

Highlight this item and hit <Enter> to save any changes you've made. You will remain in the Setup utility.

Notes

Appendix A
BIOS POST Codes

This section lists the POST (Power On Self Test) codes for the PhoenixBIOS. POST codes are divided into two categories: recoverable and terminal.

Recoverable POST Errors

When a recoverable type of error occurs during POST, the BIOS will display an POST code that describes the problem. BIOS may also issue one of the following beep codes:

1 long and two short beeps - video configuration error
1 continuous long beep - no memory detected

Terminal POST Errors

If a terminal type of error occurs, BIOS will shut down the system. Before doing so, BIOS will write the error to port 80h, attempt to initialize video and write the error in the top left corner of the screen.
The following is a list of codes that may be written to port 80h.

POST Code	Description
02h	Verify Real Mode
03h	Disable Non-Maskable Interrupt (NMI)
04h	Get CPU type
06h	Initialize system hardware
07h	Disable shadow and execute code from the ROM.
08h	Initialize chipset with initial POST values
09h	Set IN POST flag
0Ah	Initialize CPU registers
0Bh	Enable CPU cache
0Ch	Initialize caches to initial POST values
0Eh	Initialize I/O component
0Fh	Initialize the local bus IDE
10h	Initialize Power Management
11h	Load alternate registers with initial POST values
12h	Restore CPU control word during warm boot
13h	Initialize PCI Bus Mastering devices
14h	Initialize keyboard controller
16h	1-2-2-3 BIOS ROM checksum
17h	Initialize cache before memory Auto size

POST Code	Description
18h	8254 timer initialization
1Ah	8237 DMA controller initialization
1Ch	Reset Programmable Interrupt Controller
20h	1-3-1-1 Test DRAM refresh
22h	1-3-1-3 Test 8742 Keyboard Controller
24h	Set ES segment register to 4 GB
28h	Auto size DRAM
29h	Initialize POST Memory Manager
2Ah	Clear 512 kB base RAM
2Ch	1-3-4-1 RAM failure on address line ***xxxx****
2Eh	1-3-4-3 RAM failure on data bits ***xxxx**** of low byte of memory bus
2Fh	Enable cache before system BIOS shadow
32h	Test CPU bus-clock frequency
33h	Initialize Phoenix Dispatch Manager
36h	Warm start shut down
38h	Shadow system BIOS ROM
3Ah	Auto size cache
3Ch	Advanced configuration of chipset registers
3Dh	Load alternate registers with CMOS values
41h	Initialize extended memory for RomPilot
42h	Initialize interrupt vectors
45h	POST device initialization
46h	2-1-2-3 Check ROM copyright notice
47h	Initialize I20 support
48h	Check video configuration against CMOS
49h	Initialize PCI bus and devices
4Ah	Initialize all video adapters in system
4Bh	QuietBoot start (optional)
4Ch	Shadow video BIOS ROM
4Eh	Display BIOS copyright notice
4Fh	Initialize MultiBoot
50h	Display CPU type and speed
51h	Initialize EISA board
52h	Test keyboard
54h	Set key click if enabled
55h	Enable USB devices
58h	2-2-3-1 Test for unexpected interrupts
59h	Initialize POST display service
5Ah	Display prompt “Press F2 to enter SETUP”
5Bh	Disable CPU cache

POST Code	Description
5Ch	Test RAM between 512 and 640 kB
60h	Test extended memory
62h	Test extended memory address lines
64h	Jump to UserPatch1
66h	Configure advanced cache registers
67h	Initialize Multi Processor APIC
68h	Enable external and CPU caches
69h	Setup System Management Mode (SMM) area
6Ah	Display external L2 cache size
6Bh	Load custom defaults (optional)
6Ch	Display shadow-area message
6Eh	Display possible high address for UMB recovery
70h	Display error messages
72h	Check for configuration errors
76h	Check for keyboard errors
7Ch	Set up hardware interrupt vectors
7Dh	Initialize Intelligent System Monitoring
7Eh	Initialize coprocessor if present
80h	Disable onboard Super I/O ports and IRQs
81h	Late POST device initialization
82h	Detect and install external RS232 ports
83h	Configure non-MCD IDE controllers
84h	Detect and install external parallel ports
85h	Initialize PC-compatible PnP ISA devices
86h	Re-initialize onboard I/O ports.
87h	Configure Motherboard Configurable Devices (optional)
88h	Initialize BIOS Data Area
89h	Enable Non-Maskable Interrupts (NMIs)
8Ah	Initialize Extended BIOS Data Area
8Bh	Test and initialize PS/2 mouse
8Ch	Initialize floppy controller
8Fh	Determine number of ATA drives (optional)
90h	Initialize hard-disk controllers
91h	Initialize local-bus hard-disk controllers
92h	Jump to UserPatch2
93h	Build MPTABLE for multi-processor boards
95h	Install CD ROM for boot
96h	Clear huge ES segment register
97h	Fix up Multi Processor table
98h	1-2 Search for option ROMs. One long, two short beeps on checksum failure

POST Code	Description
99h	Check for SMART Drive (optional)
9Ah	Shadow option ROMs
9Ch	Set up Power Management
9Dh	Initialize security engine (optional)
9Eh	Enable hardware interrupts
9Fh	Determine number of ATA and SCSI drives
A0h	Set time of day
A2h	Check key lock
A4h	Initialize typematic rate
A8h	Erase F2 prompt
AAh	Scan for F2 key stroke
ACh	Enter SETUP
AEh	Clear Boot flag
B0h	Check for errors
B1h	Inform RomPilot about the end of POST.
B2h	POST done - prepare to boot operating system
B4h	1 One short beep before boot
B5h	Terminate QuietBoot (optional)
B6h	Check password (optional)
B7h	Initialize ACPI BIOS
B9h	Prepare Boot
BAh	Initialize SMBIOS
BBh	Initialize PnP Option ROMs
BCh	Clear parity checkers
BDh	Display MultiBoot menu
BEh	Clear screen (optional)
BFh	Check virus and backup reminders
C0h	Try to boot with INT 19
C1h	Initialize POST Error Manager (PEM)
C2h	Initialize error logging
C3h	Initialize error display function
C4h	Initialize system error handler
C5h	PnPnd dual CMOS (optional)
C6h	Initialize note dock (optional)
C7h	Initialize note dock late
C8h	Force check (optional)
C9h	Extended checksum (optional)
CAh	Redirect Int 15h to enable remote keyboard
CBh	Redirect Int 13h to Memory Technologies Devices such as ROM, RAM, PCMCIA, and serial disk
CCh	Redirect Int 10h to enable remote serial video

POST Code	Description
CDh	Re-map I/O and memory for PCMCIA
CEh	Initialize digitizer and display message
D2h	Unknown interrupt

The following are for boot block in Flash ROM

POST Code	Description
E0h	Initialize the chipset
E1h	Initialize the bridge
E2h	Initialize the CPU
E3h	Initialize system timer
E4h	Initialize system I/O
E5h	Check force recovery boot
E6h	Checksum BIOS ROM
E7h	Go to BIOS
E8h	Set Huge Segment
E9h	Initialize Multi Processor
EAh	Initialize OEM special code
EBh	Initialize PIC and DMA
ECh	Initialize Memory type
EDh	Initialize Memory size
EEh	Shadow Boot Block
EFh	System memory test
F0h	Initialize interrupt vectors
F1h	Initialize Run Time Clock
F2h	Initialize video
F3h	Initialize System Management Manager
F4h	Output one beep
F5h	Clear Huge Segment
F6h	Boot to Mini DOS
F7h	Boot to Full DOS

* If the BIOS detects error 2C, 2E, or 30 (base 512K RAM error), it displays an additional word-bitmap (***xxxx***) indicating the address line or bits that failed. For example, "2C 0002" means address line 1 (bit one set) has failed. "2E 1020" means data bits 12 and 5 (bits 12 and 5 set) have failed in the lower 16 bits. The BIOS also sends the bitmap to the port-80 LED display. It first displays the checkpoint code, followed by a delay, the high-order byte, another delay, and then the loworder byte of the error. It repeats this sequence continuously.

Notes

Appendix B

Installing Software Drivers and Windows Operating System

After all the hardware has been installed, you must first configure the Adaptec Embedded Serial ATA RAID Driver before you install the Windows operating system. The necessary drivers are all included on the Supermicro bootable CDs that came packaged with your motherboard. (For the information on Adaptec's SATA HostRAID Utility based on Marvell's chip, please refer to Appendix C.)

B-1 Introduction to the Adaptec Embedded Serial ATA RAID Controller Driver

Serial ATA (SATA)

Serial ATA(SATA) is a physical storage interface. It uses a single cable with a minimum of four wires to create a point-to-point connection between devices. It is a serial link which supports SATA Transfer rates from 150MBps. Because the serial cables used in SATA are thinner than the traditional cables used in Parallel ATA(PATA), SATA systems have better airflow and can be installed in smaller chassis than Parallel ATA. In addition, the cables used in PATA can only extend to 40cm long, while Serial ATA cables can extend up to one meter. Overall, Serial ATA provides better functionality than Parallel ATA.

Introduction to the Intel 6300ESB (Hance Rapids) I/O Controller Hub

Located in the South Bridge of the Intel E7525 Tumwater Chipset, the 6300ESB (Hance Rapids) I/O Controller Hub provides the I/O subsystem with access to the rest of the system. It supports 2-channel Ultra ATA/100 Bus Master IDE controller (PATA) and two Serial ATA (SATA) Host Controllers, which support up to two Serial ATA ports and up to two RAID drives. The 6300ESB (Hance Rapids) I/O Controller Hub supports the following Parallel ATA (PATA) and Serial (SATA) device configurations:

To configure SATA RAID for Operating Systems that support RAID functions(--Windows, Red Hat & SuSe, Linux)

1. Select "Main Setup Setting" from the Phoenix BIOS menu and set "SATA RAID Enable" to Enable. (The Defualt setting is Disabled.)

3. Go to the "Exit" menu and select "Save and Exit". Hit the <Enter> key to save the change and exit the Phoenix BIOS.

4. Press <Ctrl><A> for Adaptec RAID Configuration Utility.

The Adaptec Embedded Serial ATA with HostRAID Controller Driver

Adaptec's Embedded Serial ATA RAID with HostRAID controller adds RAID functionality to the Serial ATA I/O controller by supporting RAID 0 (Striping) or RAID 1 (Mirroring) to enhance the industry's pioneer PCI-to-e host controller products. RAID striping (RAID 0) can greatly improve hard disk I/O performance because of its capability in striping data across multiple drives. RAID mirroring (RAID 1) allows the data to be simultaneously written to two drives, so critical data is always available even if a single hard disk fails. Due to the built-in functionality, the X6DAT-G/X6DAi-G is specially designed to keep pace with the increasing performance demands of computer systems by improving disk I/O throughput and providing data accessibility regardless of a single disk failure. By incorporating the Adaptec Embedded Serial ATA into the motherboard design, Supermicro's X6DAT-G/X6DAi-G offers the user with the benefits of SATARAID without the high costs associated with hardware RAID applications.

(*Note: For Adaptec's RAID Driver Installation Instructions, please refer to the Adaptec RAID Controller User's Guide: "Emb_SA_RAID_UG.pdf" in the CD that came with this motherboard. You can also download a copy of Adaptec's User's Guide from our web site at www.supermicro.com.)

Using the Adaptec RAID Configuration Utility (ARC)

The Adaptec RAID Configuration Utility is an embedded BIOS Utility, including:

*Array Configuration Utility: Use this utility when you want to create, configure and manage arrays.

* Disk Utilities: Use this option to format or verify disks.

To run the Adaptec RAID Configuration Utility, you will need to enable the RAID function in the system BIOS (refer to Chapter 4 for System BIOS Configurations), and then, press the <Ctrl> and <A> keys simultaneously when prompted to do so during the system startup. (Refer to the previous page for detailed instructions.)

(*Note: To select an option, use the arrow keys to highlight the item and then press the <Enter> key to select it. To return to the previous menu, press the <ESC> key.)

A. Using the Array Configuration Utility (ACU)

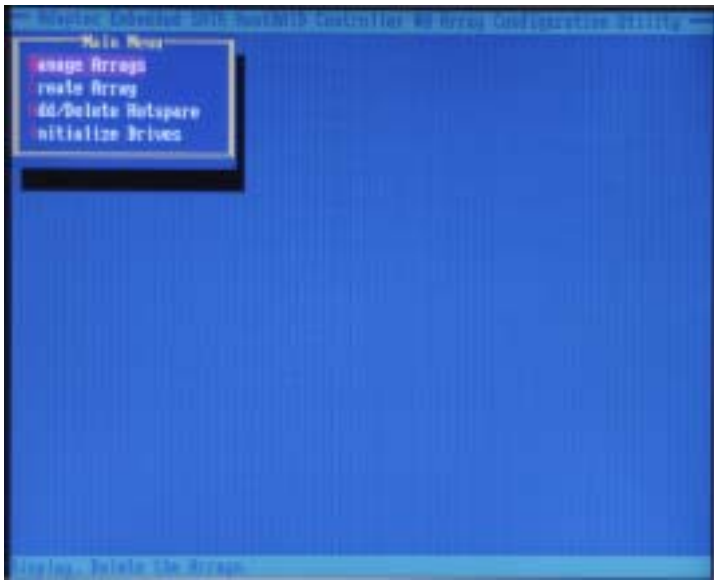
The Array Configuration Utility (ACU) enables you to create, manage, and delete arrays from the controller's BIOS, add and delete spare drives, and initialize drives. During the system startup, press <Ctrl> and <A> key simultaneously, and the main menu will appear.

Adaptec RAID Configuration Utility
Adapter: Embedded SATA HostRAID Controller#0
Options
Array Configuration Utility
Disk Utilities
Arrow keys to move cursor, <Enter> to select option, <Esc> to exit (**default)

Managing Arrays

Select this option to view array properties, and delete arrays. The following sections describe the operations Of "Managing Arrays".

To select this option, use the arrow keys and the <enter> key to select "Managing Arrays" from the main menu (as shown above).



Viewing Array Properties

To view the properties of an existing array:

1. At the BIOS prompt, press **Ctrl+A**.

2. From the ARC menu, select **Array Configuration Utility (ACU)**.

3. From the ACU menu, select **Manage Arrays** (as shown on the previous screen.)

4. From the List of Arrays dialog box, select the array you want to view and press **Enter**.

The Array Properties dialog box appears, showing detailed

information on the array. The physical disks associated with the array are displayed here.

5. Press **Esc** to return to the previous menu.

Deleting Arrays

**Warning: Back up the data on an array before you delete it to prevent the loss of data. Deleted arrays cannot be restored.*

To delete an existing array:

1. Turn on your computer and press **Ctrl+A** when prompted to access the ARC utility.

2. From the ARC main menu, select **Array Configuration Utility (ACU)**.

3. From the ACU menu, select **Manage Arrays**.

4. Select the array you wish to delete and press **Delete**.

5. In the Array Properties dialog box, select **Delete** and press **Enter**. The following prompt is displayed:

> **Warning!! Deleting the array will render array unusable. Do you want to delete the array?(Yes/No):*
>
> ***RAID 1 only*—the following prompt is also displayed:**
>
> *Deleting the partition will result in data loss! Do you also want to delete the partition? (Yes/No):*

6. Press **Yes** to delete the array or partition or **No** to return to the previous menu.

7. Press **Esc** to return to the previous menu.

Creating Arrays

Before creating arrays, make sure the disks for the array are connected and installed in your system. Note that disks with no usable space, or disks that are un-initialized are shown in gray and cannot be used. See *Initializing Disk Drives*.

To create an array:

1 Turn on your computer and press **Ctrl+A** when prompted to access the ARC utility.

2 From the ARC menu, select **Array Configuration Utility Main Menu (ACU)** (as shown on the first screen on page B-5).

3 From the ACU menu, select **Create Array**.

4 Select the disks for the new array and press Insert (as the screen shown below).

(*Note: To deselect any disk, highlight the disk and press **Delete**.)

Select drives to create Array
00 WDC WD360GD-00ELX1 34.4GB
01 WDC WD360GD-00ELX1 34.4GB
Selected Drives
(INS) Select Drive, (DEL) Deselect Drive, (↑↓) Moves Cursor
(Enter) Complete Selection, (Esc) Cancel Selection

5 Press **Enter** when both disks for the new array are selected. The Array Properties menu displays (as the screen shown below).

Select drives to create Array
00 WDC WD360GD-00ELX1 34.4GB
Selected Drives
00 WDC WD360GD-00ELX1 34.4GB
01 WDC WD360GD-00ELX1 34.4GB
(Enter) Complete Selection, (Esc) Cancel Selection

Assigning Array Properties

Once you've create a new array, you are ready to assign the properties to the array.

***Caution:** Once the array is created and its properties are assigned, you cannot change the array properties using the ACU. You will need to use the Adaptec Storage Manager - Browser Edition. (Refer to Adaptec's User's Guide in the enclosed CD.)

To assign properties to the new array:

1. In the Array Properties menu (as shown in the screen below), select an array type and press **Enter**.

Note that only the available array types: RAID 0, and RAID1, are displayed on the screen. (*RAID 0 or RAID 1 requires two drives.)

2. Under the item "**Arrays Label**", type in an label and press **Enter**. (***Note:** The label shall not be more than 15 characters.)

3. For RAID 0, select the desired stripe size. (*Note: Available stripe sizes are 16, 32, and 64 KB-default. It is recommended that you *do not* change the default setting.)

4. The item: **"Create RAID via"** allows you to select between the different creating methods for RAID 0 and RAID 1.

The following table gives examples of when each is appropriate.

Raid Level	Create Via	When Appropriate
RAID 0	No Init	Creating a RAID 0 on new drives
RAID 0	Migrate (*Note)	Creating a RAID 0 from one new drive and one drive with data you wish to preserve
RAID 1	Build1	Any time you wish to create a RAID 1, but especially if you have data on one drive that you wish to preserve
RAID 1	Clear	Creating a RAID 1 on new drives, or when you want to ensure that the array contains no data after creation.
RAID 1	Quick	Fastest way to create a RAID 1. Appropriate when using new drives
RAID 1	Init	

(*Note: If you select Migrate for RAID 0, or Build for RAID 1, you will be asked to select the source drive. The contents of the source drive will be preserved. However, the data on the new drive will be lost.)

5. When you are finished, press **Done (as the screen shown below)**.

Notes:

1. Before adding a new drive to an array, back up any data contained on the new drive. Otherwise, all data will be lost.

2. If you stop the Build or Clear process on a RAID 1 from ACU, you can restart it by pressing Ctrl+R.

3. A RAID 1 created using the Quick Init option may return some data mis-compares if you later run a consistency check. This is normal and is not a cause for concern.

4. The ACU allows you to use drives of different sizes in a RAID . However, during a build operation, only the smaller drive can be selected as the source or first drive.

5. When migrating from single volume to RAID 0, migrating from a larger drive to a smaller drive is allowed. However, the destination drive must be at least half the capacity of the source drive.

6. Adaptec does not recommend that you migrate or build an array on Windows dynamic disks (volumes), as it will result in data loss.

Warning: Do not interrupt the creation of a RAID 0 using the Migrate option. If you do, you will not be able to restart, or to recover the data that was on the source drive.

Adding a Bootable Array

To make an array bootable:

1. From the Main menu, select **Manage Arrays.**

2. From the List of Arrays, select the array you want to make bootable, and press **Ctrl+B.**

3. Enter Y to create a bootable array when the following message is displayed: "This will make all other existing bootable array non-bootable. Do you want to make this array bootable? (Yes/No):" Then, a bootable array will be created. An asterisk will appear next to the bootable array (as shown in the picture below:)

Deleting a Bootable Array

To delete a bootable array:

1. From the Main menu, select **Manage Arrays.**

2. From the List of Arrays, select the bootable array (*) you want to delete, and press **Ctrl+B**. (* a bootable array is the array marked with an asterisk (as shown in the picture above.)

3. Enter Y to delete a bootable array when the following message is displayed: "The array is already marked bootable. Do you want to make this array as not bootable? (Yes/No):" Then, the bootable array will be deleted and the asterisk will disappear.

(*Note: do not use the delete key to delete the bootable array.)

Initializing Disk Drives

If an installed disk does not appear in the disk selection list for creating a new array, or if it appears grayed out, you may have to initialize it before you can use it as part of an array. Drives attached to the controller must be initialized before they can be used in an array.

Caution: Initializing a disk overwrites the partition table on the disk and makes any data on the disk inaccessible. If the drive is used in an array, you may not be able to use the array again. ***Do not*** initialize a disk that is part of a boot array. To determine which disks are associated with a particular array, please refer to *Viewing Array Properties.*

To initialize drives:

1. Turn on your computer and press **Ctrl+A** when prompted to access the ARC utility.

2. From the ARC menu, select **Array Configuration Utility (ACU)** (as shown in the screen below).

Adaptec RAID Configuration Utility
Adaptec Embedded SATA HostRAID Controller#0
Options
Array Configuration Utility
Disk Utilities
Arrow keys to move cursor, (Enter) to select option, (Esc) to exit (*=default)

3. Select **Initialize Drives** (as shown in the screen below).

4. Use the up and down arrow keys to highlight the disk you wish to initialize and press **Insert** (as shown in the screen below).

5. Repeat Step 4 so that both drives to be initialized are selected (as shown in the screen below).

6. Press **Enter**.

7. Read the warning message as shown in the screen.

Warning: Initialization will erase all Array information
from the selected drives. Any Array using any of these drives
as members will be effected. Do you want to continue?(Yes/No):

8. Make sure that you have selected the correct disk drives to initialize. If correct, type Y to continue.

Rebuilding Arrays

***Note 1:** Rebuilding applies to Fault Tolerant array (RAID 1) only.

If an array Build process (or initialization) is interrupted or critical with one member missing, you must perform a Rebuild to get the array to Optimal status. For a critical array Rebuild operation, the optimal drive is the source drive.

***Note 2:** If no spare array exists and a hard disk drive fails, you need to create a spare before you can rebuild an array.

To Rebuild an array:

1 From the Main Menu, select **Manage Arrays** (as shown in the screen below). From the List of Arrays, select the array you want to Rebuild.

2 Press **Ctrl+R** to Rebuild.

Using the Disk Utilities

The Disk Utilities enable you to format or verify the media of your Serial ATA hard disks.

To access the disk utilities:

1. Turn on your computer and press **Ctrl+A** when prompted to access the ARC utility (as shown in the screen below.)

Adaptec RAID Configuration Utility
Adapter: Embedded SATA HostRAID Controller#0
Options
Array Configuration Utility
Disk Utilities
Arrow keys to move cursor, <Enter> to select option, <Esc> to exit (*=default)

2. From the ARC menu, select **Disk Utilities** as shown in the screen below.

Adaptec RAID Configuration Utility
Adaptec Embedded SATA HostRAID Controller#0
Options
Array Configuration Utility
Disk Utilities
Arrow keys to move cursor, <Enter> to select option, <Esc> to exit (*=default)

3 Select the desired disk and press **Enter** (as shown in the screen below.)

Adaptec RAID Configuration Utility
Adaptec Embedded SATA HostRAID Controller#0
Select SATA Disk and press <Enter>
SATA Port #0 WDC WD360GD-00ELX1 32.06G32
SATA Port #1 WDC WD360GD-00ELX1 32.06G32
SATA Port #2 No device
SATA Port #3 No device
SATA Port #4 No device
SATA Port #5 No device
SATA Port #6 No device
SATA Port #7 No device
Only drives present at POST are displayed
Arrow keys to move cursor, <Enter> to select option, <Esc> to exit (*=default)

You can choose from the following options:

1. Format Disk—Simulates a low-level format of the hard drive by writing zeros to the entire disk. Serial ATA drives are low-level formatted at the factory and do not need to be low-level formatted again.

(*Caution: Formatting destroys all data on the drive. Be sure to back up your data before performing this operation.)

2. Verify Disk Media—Scans the media of a disk drive for defects.

To Exit Adaptec RAID Configuration Utility

1. Once you have completed RAID array configurations, press **ESC** to exit. The following screen will appear.

2. Press **Yes** to exit the Utility.

(*For more information regarding Adaptec RAID Utility, please refer to Adaptec's User's Guide in the CD included in your shipping package. You can also download a copy of Adaptec User's Guide from our web site at: www. supermicro.com.)

B-2 Installing Intel's ESB6300 (Hance Rapids) Driver by Adaptec and the Windows OS

a. Insert Supermicro's bootable CD that came with the package into the CD Drive during the system reboot, and the screen:"Super Micro Driver Diskette Maker" will appear.

b. From the list displayed on the screen, choose the item: "Intel Hance Rapids Driver by 3rd Party (Adaptec)" and press <ENTER>.

c. From the next screen displayed, choose the OS driver you want to install and press <Enter>.

d. Insert a formatted diskette into drive A: and press <Enter> as prompted.

e. Exit the program after the process is completed. Then, reboot the system.

f. Insert Microsoft Windows OS Setup CD in the CD Driver, and the system will start to boot up from CD.

g. Press the <F6> key when the message-"Press F6 if you need to install a third party SCSI or RAID driver" displays.

h. When the Windows OS Setup screen appears, press "S" to specify additional device(s).

i. Insert the driver diskette-"Adaptec Embedded Serial ATA Raid Controller Driver" into Drive A: and press the <Enter> key.

j. Choose Adaptec Embedded Host Serial ATA Raid Controller from the list indicated in the Windows OS Setup Screen, and press the <Enter> key.

k. Press the <Enter> key to continue the installation process. (If you need to specify any additional devices to be installed, do it at this time.) Once all devices are specified, press the <Enter> key to continue with the installation.

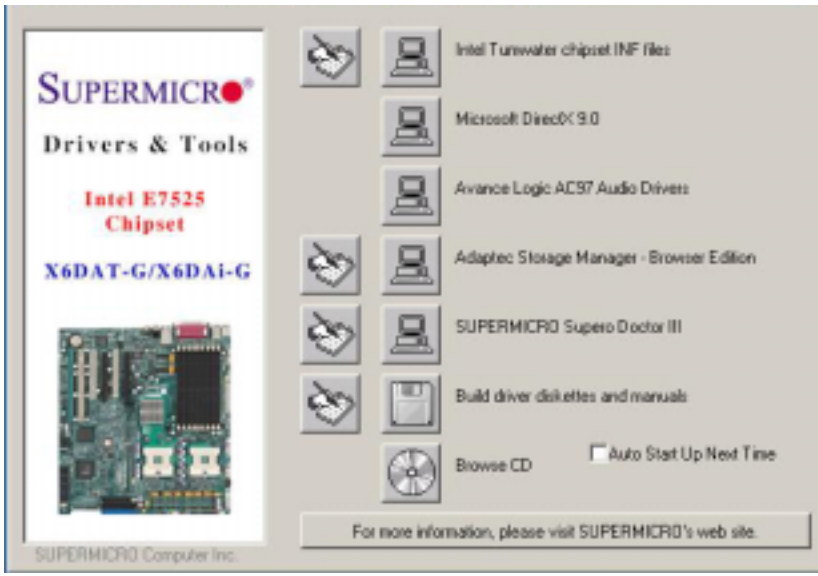
l. From the Windows OS Setup screen, press the <Enter> key. The OS Setup will automatically load all device files, and, then, continue the Windows OS installation.

m. After Windows OS Installation is completed, the system will automatically reboot.

B-3 Installing Other Software Programs and Drivers

A. Installing Drivers other than Adaptec Embedded Serial ATA RAID Controller Driver

After you've installed Windows Operating System, a screen as shown below will appear. You are ready to install software programs and drivers that have not yet been installed. To install these software programs and drivers, click the icons to the right of these items.



Driver/Tool Installation Display Screen

(*Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on the list.** You should install everything here except for the Supero Doctor utility, Intel LDCM and the LAN/SCSI driver diskettes, which are optional. The bottom icon with a CD on it allows you to view the entire contents of the CD.)

(*Please refer to the Adaptec User's Guide for the installation of Adaptec's Serial ATA RAID Controller Driver. Adaptec's User's Guide is included in the CD. You can also download a copy of the user's guide from our web site.)

Supero Doctor III

The Supero Doctor III program is a Web base management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called SD III Client. The Supero Doctor III program included on the CDROM that came with your motherboard allows you to monitor the environment and operations of your system. Supero Doctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the Supero Doctor III interface.

Supero Doctor III Interface Display Screen-I (Health Information)

Supero Doctor III Interface Display Screen-II (Remote Control)

(*Note: SD III Software Revision 1.0 can be downloaded from our Web site at: ftp://ftp.supermicro.com/utility/Supero_Doctor_III/. You can also download SDIII User's Guide at: http://www.supermicro.com/PRODUCT/Manuals/SDIII/UserGuide.pdf. For Linux, we will still recommend Supero Doctor II.)

Notes

Appendix C

Software Installation: Adaptec's SATA HostRAID Utility for Marvell's 88SX6041 Chip

(*For X6DAT-G only.)

After all the hardware has been installed, you must first configure Adaptec's Serial ATA RAID Driver (*Note) before you install the Windows operating system, and other software drivers. The necessary drivers are all included on the Supermicro CDs that came packaged with your motherboard.

C-1 Configuring Serial ATA RAID Functions

Serial ATA (SATA)

Serial ATA(SATA) is a physical storage interface. It uses a single cable with a minimum of four wires to create a point-to-point connection between devices. It is a serial link which supports SATA Transfer rates up to 150MBps. Because the serial cables used in SATA are thinner than the traditional cables used in Parallel ATA(PATA), SATA systems have better airflow and can be installed in smaller chassis than Parallel ATA. In addition, the cables used in PATA can only extend to 40cm long, while Serial ATA cables can extend up to one meter. Overall, Serial ATA provides better functionality than Parallel ATA.

Introduction to Adaptec's Serial ATA RAID Controller

Adaptec Embedded Serial ATA RAID with HostRAID adds RAID functionality to the SATA I/O controller by supporting RAID levels 0, 1, and 10. With HostRAID, you can optimize the reliability, performance and data protection of the system.

Adaptec's Serial ATA RAID Storage Requirements

Adaptec's device drivers and storage management software require approximately 20 MB of disk space.

Operating Systems supported by the SATA RAID Host Controller

Microsoft
*Windows® 2000, Windows Server® 2003, and Windows XP

Linux
*Red Hat 8.0 and 9.0
*SuSE 8.1 and 8.2

Storage Management Software Overview

Adaptec Embedded Serial ATA RAID includes the following software tools to manage your storage subsystem:

Adaptec Storage Manager – Browser Edition—Browser-based storage management software that provides all of the creation, management, and data logging needed to manage arrays. Arrays may be set up and managed on systems using the following operating systems: Windows 2000, Windows Server 2003, and Windows XP

Red Hat Linux 8.0 and 9.0-SuSE Linux 8.1 and 8.2.

Adaptec RAID Configuration (ARC) Utility—Part of the controller's built-in BIOS code. You start ARC by pressing Ctrl+A during BIOS startup.

Array Configuration Utility (ACU)—A DOS/BIOS application used to create, configure, and manage arrays.

C-2 Adaptec's SATA RAID Host Driver Installation

Installing the Driver in a New Windows System

To install the driver to a new system that does not have the OS installed:

1. Create a driver disk by following the instructions from the Web site or the product CD.

2. Restart the computer.

3. If creating an array, press Ctrl-A when prompted to enter the ARC utility. For instructions on creating an array from the BIOS, see Adaptec RAID Configuration Utility. For a simple volume, skip to Step 4.

4. When the array is finished building or if you are continuing from Step3, insert the Windows setup CD and restart the system.

5. Press F6 when prompted to install a third-party driver.

(*Note: When F6 is active, a prompt appears at the bottom of the screen. Press F6 immediately—you only have 5 seconds. If you miss your chance, restart this Windows installation to complete it correctly. Otherwise, Windows will not recognize your controller.)

6. Insert the driver disk you created in Step 1 and wait until prompted to install a driver.

7. Press S to specify that the driver is on the floppy disk, and press Enter. Windows searches the disk for a suitable driver.

8. When the Adaptec Embedded Serial ATA HostRAID driver is found, press Enter. Follow the remaining on-screen instructions to complete your installation.

Installing the Driver in an Existing Windows System

Please follow the steps listed below to install a driver in a system that already has a Windows operating system:

1. Create a driver disk by following the instructions from the Web site or the product CD.

2. Start Windows. Windows launches the Found New Hardware Wizard, which searches for the controller driver.

3. Insert the driver disk you created in Step 1. Select the floppy disk drive as the source and click Next.

4. If necessary, select the appropriate driver for your operating system.

5. Click Next as needed to complete the controller installation.

6. Remove the driver disk.

7. If prompted, restart the computer.

8. Your installation is complete. If you want to create an array from the BIOS, see the section-"Adaptec RAID Configuration Utility". If you want to create an array from the operating system, see the section-"Using Adaptec Storage Manager – Browser Edition".

Installing the driver in a new Linux system

To Install the Red Hat 8.0 or 9.0 Driver in a New Linux System:

1. Obtain a driver disk from either the Web site or the product CD.

2. Restart the computer.

3. If creating an array, press Ctrl-A when prompted to enter the ARC utility. For instructions on creating an array from the BIOS, see the section-"Adaptec RAID Configuration Utility". For a simple volume, skip to Step 4.

4. When the array is finished building, or if you are continuing from Step 3, insert the Red Hat CD Disk 1 in the CD-ROM drive and restart the system.

5. When the Red Hat Welcome screen appears, type expert or linux dd at the boot prompt.

6. When prompted, insert the driver disk (see Step 1) and select OK.

7. Follow the prompts to set up your preferred environment.

8. If you intend to install other third-party devices, proceed with the installation of those devices. Otherwise, select Done.

9. Continue with the Linux installation according to the Red Hat documentation.

Installing the SuSE 8.1 or 8.2 Driver in a New Linux System

1. Obtain a driver disk from either the Web site or the product CD.

2. Restart the computer.

3. If creating an array, press Ctrl-A when prompted to enter the ARC utility. For instructions on creating an array from the BIOS, see the section-"Adaptec RAID Configuration Utility". For a simple volume, skip to Step 4.

4. When the array is finished building, or if you are continuing from Step3, insert the SuSE CD Disk 1 in the CD-ROM drive and restart the system.

5. When the SuSE Installation menu appears:

* For SuSE 8.1—press the Alt key, then select installation option from the Menu and press Enter.

* For SuSE 8.2—press the F3 key, then select installation option from the Menu and press Enter.

6. When prompted, insert the driver disk you created (see Step 1) and press any key to continue.

7. Follow the prompts to set up your preferred environment.

8. Continue with the Linux installation according to the SuSE documentation.

9. After reboot occurs the SuSE Menu appears:

* For SuSE 8.1—type noapic at the boot options, then press

Enter.

* For SuSE 8.2—type acpi=off at the boot options, then press Enter.

(*Note: See Step 10 to include these parameters automatically during bootup.)

10. When the Linux installation is complete, go to the script file by typing:

* For SuSE 8.1 edit/boot/grub/menu.lst

Type noapic after vga=xxx as in this example:

Kernel(hd0,0)/vmlinux root=/dev/hdc3 vga=791 noapic

* For SuSE 8.2 edit/boot/grub/menu.lst

Type acpi=off after vga=xxx as in this example:

Kernel(hd0,0)/vmlinux root=/dev/hdc3 vga=791 acpi=off

Installing or Updating the Driver in an Existing Red Hat or SuSE Linux System

* To install the driver in an existing Red Hat or SuSE Linux system, type: rpm -Uvh xxx.yyy.rpm

*To update the driver in an existing Linux system, type:

rpm -Uvh —force xxx.yyy.rpm

where xxx is the name of the driver file and yyy is the processor

type.

C-3 Installing Adaptec Storage Management

A. Browser Edition

Overview

This chapter discusses the installation procedure for installing Adaptec Storage Manager – Browser Edition to enable remote and local management of arrays.

Browsers supported:

To run Adaptec Storage Manager – Browser Edition, your computer must have a Web browser supporting JavaScript and cookies only. The following versions are supported:

Windows

* Internet Explorer (IE) 5.0 or later

* Netscape 7 or later

Linux

* Adaptec-supplied and installed version of Mozilla

*Netscape 7 or later

When using Adaptec Storage Manager, you need to log on to your system with administrator privileges.

Typical, Custom, and Compact Installations

You can select from these setup options:

* Typical (default)—Supports local and remote management; however, Adaptec SNMP is not included.

* Custom—For expert users. Primarily used on Web servers or when you want to make sure SNMP and Notifier are available for a managed system.

You can select from these components:

* Managed System Components—If you choose this selection only, the installation is the same as a Compact installation.

* Adaptec Web Server—Installs components allowing managed systems to communicate with Web browsers.

* Adaptec Storage Manager Notifier—Installs messaging, including email and broadcaster capabilities.

* Adaptec SNMP—Installs components used by SNMP-based applications. Requires Microsoft SNMP agents to be installed to function. Not included in a Typical installation.

*Compact—Installs only the components required on a remotely managed system. See Managed System Components, above.

(*Note: When you perform a Typical or Compact installation, components needed for communication and remote management are installed automatically.*)

B. On Windows

**Note: When installing on a FAT 32 file system, the folder being installed is automatically hidden.)

To install Adaptec Storage Manager – Browser Edition

1. Verify that a supported browser is installed. See the section-"Supported Browsers" for details.

2. Insert the product installation CD and wait for the Autorun executable to start the installation. If this does not occur, browse the CD and click Autorun.

3. Click Adaptec Utilities.

4. Click Install Adaptec Storage Manager.

5. Click Next in the Install Shield window.

6. Read the license agreement. If you agree to its terms, click Yes. If not, click No and terminate the installation.

The Select a Setup Type window appears. It provides three types of installations: Typical, Compact, and Custom. See the sections regarding: "Typical, Custom, and Compact Installations" for details.

7. Choose a setup type and click Next.

8. When you see the Destination Folder, click Next.

9. When you see the Setup Information, click Next.

The Setup Status window shows progress using a scroll bar. Before the scroll bar shows the installation is completed, another window pops up indicating that a security certificate has been generated.

10. Click OK.

The Root Certificate Store window appears.

11. Click Yes.

The security certificate generated during installation is added to the Certificate Store. If you click No at this point, you will need to install the certificate the first time you run Adaptec Storage Manager.

12. When prompted to restart your computer, accept the default (Yes) and click Finish.

13. The system restarts to complete the installation.

14. Remove the product installation CD before the system restarts; otherwise, the installation will start again.

Configuring Internet Browsers on Windows

If you are managing a local storage array and your computer uses a proxy server, you need to configure your browser to enable Adaptec Storage Manager to bypass the proxy server. Also, if you are managing remote systems, you need to configure Adaptec Storage Manager to bypass the proxy server when communicating with these systems.

Configuring Internet Explorer for Local Management

When using the High security setting, you must enable the following settings manually:

* JavaScript

* Cookies (not stored)

You do not need to enable the following custom level security settings for the local Intranet in Internet Explorer 5 and 5.5. Select Tools > Internet Options to access these settings:

* Active Scripting

* Allow per session cookies (not stored) (*Note: In Internet Explorer 6.0 there is no security setting for cookies. Cookie configuration was removed from the Privacy tab. There is no setting for blocking Intranet cookies.)

If you are using a proxy server to access the Internet, you must bypass the proxy server to access the Adaptec Storage Manager Web server. To verify whether you are using a proxy server:

1. From the Internet Option window, click the Connections tab.

2. Click LAN Settings.

* If the Use a proxy server box isn't checked, exit by clicking OK. You aren't using a proxy server, so ignore this setting.

* If the Use a proxy server box is checked, make sure the Bypass proxy server for local addresses box is also checked. Then, click the Advanced button. In the Exceptions window, enter localhost as an entry.You are now ready to proceed to the section-"Using Adaptec Storage Manager – Browser Edition".

Configuring Internet Explorer for Remote Management

If you know the IP address of the system you want to manage remotely:

1. Choose Tools > Internet Options > Connections > LAN Settings.

2. Select Use a proxy server for your LAN > Advanced.

3. In the Exceptions section, type the managed system's IP address.

Configuring Netscape Navigator for Local Management

(*Note: These instructions apply specifically to version 7 and may differ in later versions.)

To configure Netscape Navigator:

1. Log in to your computer with administrator access.

2. Select Edit > Preferences.

3. In the Preferences window, click the right arrow on the Privacy and Security line. Ensure that one of the Enable cookies options is selected.

4. Select the Advanced line. Ensure that Enable Javascript for Navigator is checked.

5. Exit Navigator, then restart it. This enables any settings you have modified.

6. You are now ready to proceed to C-4-"Using Adaptec Storage Manager – Browser Edition".

Configuring Netscape Navigator for Remote Management

If you know the IP address of the system you want to manage remotely:

1. Choose Edit> Preferences > Advanced> Proxies > Manual proxy configuration > No Proxy For.

2. Type the managed system's IP address.

To install Adaptec Storage Manager on Linux

(*Note: When performing this installation, keep in mind that Linux is case sensitive.)

To install Adaptec Storage Manager on a Linux computer and configure the desired Internet browser:

1. Insert the product installation CD.

2. Install the software by typing: sh <mount-point>/install.sh.

The <mount-point> differs among computers, but /mnt/cdrom, /media/cdrom, or cdrom usually works. A Welcome window appears.

3. Click Next. The License Agreement window appears.

4. Read the license agreement. If you agree to its terms, click Accept. If not, click Cancel and terminate the installation.

The Choose Setup Type window appears. It provides three types of installations: Typical, Compact, and Custom. See the section-"Typical, Custom, and Compact Installations" for details.

5. Choose a setup type and click Next. The Start Copying window appears.

6. Click Next. The Running Non-Interactive Setup window displays the files being loaded onto the system.

7. Click Next when prompted. A Setup Complete window appears.

8. Click Complete. A message window appears reminding you that any proxy servers must be bypassed for the RAID management application to work.

9. Click OK. The Shell window you used to launch the installation indicates that some daemons are being started.

The installation creates a shortcut to Adaptec Storage Manager in the System tab. This shortcut launches Adaptec Storage Manager using Mozilla.

Unless the controller driver was installed as part of this installation, you do not need to restart your computer.

10. Remove the product installation CD.

Your computer must have a Web browser supporting JavaScript and cookies. To use Adaptec Storage Manager, you need to log on to your computer with root privileges.

C-4.Using Adaptec Storage Manager(-Browser Edition)

Overview

This chapter describes how to use Adaptec Storage Manager – Browser Edition to manage arrays.

(*Note: Your controller may not support all of the features described. In most cases if a feature is not supported by your controller, the feature does not appear in the interface.)

With Adaptec Storage Manager, you can:

* Locally manage a system containing a supported Adaptec RAID controller that has Windows or Linux and a supported browser.

* Remotely manage any system containing a supported Adaptec RAID controller that has Managed System Components (see the section regarding Typical, Custom, and Compact Installations). You can manage a system remotely from a system that does not contain a RAID controller.

These same Windows and Linux systems can also be managed remotely by either of these methods:

* Installing Adaptec Storage Manager on the remote system.

* Directing the browser on the remote system to the system you want to manage.

(*Note: To manage an array remotely from a Linux system, install Adaptec Storage Manager on the system and use the Adaptec-supplied version of Mozilla as the browser.)

Architecture Overview

A locally managed system requires all of these components:

* A supported Web browser, which should already be installed on the system.

* The Adaptec Web service which supplies content displayed on the Web browser.

* An Adaptec-supplied storage agent.

A remotely managed system requires all of these components:

* The remote system must contain a browser.

* The storage agent must always be installed on the system with the RAID controller installed.

* Remote and managed systems must have a TCP/IP connection.

The Web service can be installed on the same remote system as the browser, the system with the RAID controller installed, or a third system.

Communication security is ensured because Secure-HTTP

(S-HTTP) or SSL protocols are used to encrypt all transmitted data. Connection over an Ethernet network, a corporate WAN, or VPN are supported.

Logging In

To login:

1. Start Adaptec Storage Manager – Browser Edition.

* In Windows, click Start > Programs > Adaptec Storage Manager > Adaptec Storage Manager – Browser Edition.

* In Linux, click Start > System > Adaptec Storage Manager.

The Login screen appears.

2. Enter the host name or IP address of the system you want to manage and the username and password you would use to log into that system.

3. Click Login.

(*Note:

When running Adaptec Storage Manager for the first time:

* You need to install a security certificate if you chose not to during the installation process. For instructions see the section-"Installing a Security Certificate."

* You are asked to register your software. For instructions see the section-"Registering Your Software".

To log in from any system with a Web browser:

1. Start the Web browser application and type the IP address for the system you want to access in the address bar and press Enter. For example, https://10.6.3.14:3513/adaptec.

When connection to the remote system is established, the System Login screen appears.

(*Note: If you are using a proxy server to access the Internet, you must bypass the proxy server to access the Adaptec Storage Manager Web server. See the section-"Configuring Internet Browsers on Windows" for details.)

2. Enter the host name or IP address of the system you want to manage and the administrative username and password that you would normally use to log into that system.

3. Click Login.

Installing a Security Certificate

If you chose not to install a security certificate when you installed Adaptec Storage Manager – Browser Edition, you must install the certificate when you run the application for the first time.

To create the certificate:

1. When the Security Alert window appears, click View Certificate.

2. On the Certificate window, click Install Certificate.

3. On the Certificate Import wizard window, click Next. The Certificate Import wizard window's contents change.

4. Accept the default, Automatically select the certificate store, and click Next.

5. On the root Certificate Store window, click Yes.

Another small Certificate Import wizard window appears.

6. Click OK. The Certificate window mentioned in Step 2 reappears.

7. Click OK. You are returned to the Security Alert window from Step 1.

8. Click Yes to finish the creation and storage of the certificate.

Registering Your Software

After installing and creating a security certificate, you are asked to register the product. If you want click Register Now, your computer must have an Internet connection. If you need to delay registration, click Register Later. If you choose Register Later, you will be prompted to register the application the next time you run it.

The Basics

An example of a typical Adaptec Storage Manager – Browser Edition screen is shown below.

(*Note: Depending on your operating system, browser, and color scheme you may notice some differences between this illustration and your screen.)

The action buttons are:

* Logout—Selecting Logout ends your session and returns you to the Login screen.

* Rescan—Used to rescan the configuration of the system. Typically, when a rescan is required, it occurs automatically; for example, after an array is created.

However, the system configuration can change without Adaptec Storage Manager being notified. For example, drives that are inserted or removed from a nonintelligent enclosure, or an enclosure powered on after you logged into Adaptec Storage Manager would not be displayed unless you manually rescan.

The remaining buttons open additional windows that provide more detailed information, and allow you to perform actions or change settings on a specific aspect of your storage subsystem. These are:

* Events
* Options
* Help
* Properties
* Tasks

Immediately following the header frame is a controller information line including the model number of the first Adaptec RAID controller found in the system, and the amount of cache memory (if any) installed on that controller.

Beneath the controller information are Physical Devices and Logical Devices views that show connected devices and existing arrays on this controller. Controller information and device views are repeated for each additional Adaptec RAID controller in the system.

Select the controller by clicking anywhere on the controller information. When the controller is selected, the Events, Properties and Tasks buttons change from blue to amber, indicating that clicking any of them will display an additional window with information and options specific to this controller.

Pop-Up Tool Tips

If you position the cursor over a device or button a pop-up tool tip appears. For buttons, the tips contain helpful information about the function of the button, while for devices they display additional information.

Physical Devices

The Physical Devices view displays information about the drives and enclosures attached to the Adaptec RAID controller. The devices are shown organized by the channel or port that they are connected to and shown in numerical order.

The display for each channel includes information on maximum speed capability, the number of the channel on the controller, and the number of devices found (excluding the SCSI controller).

Selecting a channel or device will turn the Events, Properties, and Tasks buttons amber. This indicates that clicking any of these buttons will display an additional window with information and options specific to that device or channel.

At the top of the Physical Devices view, grouped to the right of View, are three view selection buttons. These buttons select the physical devices connected to this controller.

Changing How Drives are Displayed

By default, the Physical Devices displays a condensed view of the controller configuration that hides detailed information about the drives. More information is available by either positioning the mouse pointer over the device or clicking on the arrowhead to the left of a row of devices.

The selected display mode button will appear in a lighter shade of blue than the other two buttons. The default display is the Text Description View, but in the condensed view used when Adaptec Storage Manager is loaded, the display is the same in all three modes.

If you change the display mode by selecting one of the other view buttons, a yellow arrow flashes to the left of any devices where the condensed display prevents omits information.

An icon is always the first entry on each device line. The icon is used to represent a hard disk drive. If a + symbol appears with the hard disk drive icon , , the drive is a hot spare. Different icons are used to represent other devices.

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is the default display mode and when expanded, will show the following information about each device:

* Capacity of the drive

* Drive manufacturer and model number

* SCSI drive ID, or Serial ATA port number

When expanded, the Full Size Capacity View button and the Relative Size Capacity View button represent each drive as a bar. A drive that is not used as part of any array is shaded blue surrounded by a dotted line.

displays a full-length bar for each drive, regardless of capacity.

displays a bar for each drive, with the largest capacity drive full-length and the other drives proportional to the drive capacity, relative to the largest drive.

Any part of a drive used in an array is shown as a gray segment within the bar. Selecting any gray segment will highlight it in amber, and in the Logical Devices view, highlight the array of which this segment is a member.

In either the Full Size Capacity View or the Relative Size Capacity View, a small portion at each end of the drive may be shown in dark gray.

The segment at the end of the drive may vary in size from drive to drive because, in addition to the RAID signature, the controller may also limit the usable capacity of each drive.

This is done because hard disk drives of apparently the same capacity from different manufacturers, or even different models from the same manufacturer, actually vary slightly in the true capacity available. Although, in normal operation this is not an issue, it can be when assigning hot spares or replacing a failed drive.

If the controller used the maximum capacity of each drive and a hot spare or replacement drive was just a few megabytes smaller, it would not be able to replace the failed drive. By rounding drive capacities down to the nearest 2 MB, this possibility is effectively eliminated.

Logical Devices

As described earlier, when Adaptec Storage Manager loads, the Logical Devices view is expanded and you can see the arrays present on the controller.

At the top of this view are the following buttons: Create, Modify, and Delete. Each button opens a wizard for the corresponding function.

Modify allows you to:

* Change an array from one RAID level to another

* Expand an array

* Change the stripe size for a RAID 0

For detailed instructions on using these buttons, refer to the online Help. The main area of the Logical Devices view is used to display the arrays on this controller. It defaults to a condensed view of top-level arrays. (*Note: The Options button allows you to display second-level arrays if your controller supports them.)

In this condensed view, the RAID level of each device, as well as whether it is protected by a hot spare, is visible.

If a global hot spare exists, all arrays that the hot spare is large enough to protect will show as protected.

In the expanded view, the icons for the arrays are arranged vertically and alongside them are the capacity, name, and type of array.

Selecting an array by clicking on it will highlight the following in amber:

* All the drives or segments that form the array in the Physical Devices view.

* The Events, Properties, and Tasks buttons in the header frame. Selecting any of these three buttons displays a new window with additional information and options specific to that array.

(*Note: For Windows Server 2003 only—to see animated icons on Adaptec Storage Manager - logical devices, go to Internet Explorer Properties/ Advanced/Multimedia, and select the Play animations in Web Pages option.)

C-5 Adaptec RAID Configuration Utility

The Array Configuration Utility (ACU) enables you to create, manage, and delete arrays from the controller's BIOS, and initialize drives.

A. Managing Arrays

Select the Manage Arrays option to view array properties and members, and delete arrays. The following sections describe these operations in greater detail.

Viewing Array Properties

To view the properties of an existing array:

1. At the BIOS prompt, press Ctrl+A.

2. From the ARC menu, select Array Configuration Utility (ACU).

3. From the ACU menu, select Manage Arrays.

4. From the List of Arrays dialog box, select the array you want to view and press Enter.

The Array Properties dialog box appears, showing detailed information on the array. The physical disks associated with the array are displayed here.

5. Press Esc to return to the previous menu.

Deleting Arrays

(**Caution**: Back up the data on an array before you delete it. Otherwise, all data on the array is lost. Deleted arrays cannot be restored.)

To delete an existing array:

1. Turn on your computer and press Ctrl+A when prompted to access the ARC utility.

2. From the ARC menu, select Array Configuration Utility (ACU).

3. From the ACU menu, select Manage Arrays.

4. Select the array you wish to delete and press Delete.

5. In the Array Properties dialog box, select Delete and press Enter. The following prompt is displayed:

Warning!! Deleting the array will render array unusable. Do you want to delete the array?(Yes/No):

RAID 1 only—the following prompt is also displayed:

Deleting the partition will result in data loss! Do you also want to delete the partition? (Yes/No):

6. Press Yes to delete the array or partition or No to return to the previous menu.

7. Press Esc to return to the previous menu.

B. Creating Arrays

Before creating arrays, make sure the disks for the array are connected and installed in your system. Note that disks with no usable space, or disks that are not initialized are shown in gray and cannot be used. See Initializing Disk Drives.

To create an array

1. Turn on your computer and press Ctrl+A when prompted to access the ARC utility.

2. From the ARC menu, select Array Configuration Utility (ACU).

3. From the ACU menu, select Create Array.

4. Select the disks for the new array and press Insert. To deselect any disk, highlight the disk and press Delete.

5. Press Enter when both disks for the new array are selected. The Array Properties menu displays.

Assigning Array Properties

(*Note: Once the array is created and its properties are assigned, you cannot change the array properties using the ACU. Instead, use Adaptec Storage Manager - Browser Edition.)

To assign properties to the new array:

1. In the Array Properties menu, select an array type and press Enter. Note that only the available array types, RAID 0, RAID 1, and RAID 10, are displayed. Each of these types requires two drives.

2. Type in an optional label for the array and press Enter.

3. For RAID 0, select the desired stripe size. Available stripe sizes are 16, 32, and 64 KB (default).

(*Note: Adaptec recommends that you do not change the default.)

4. Create RAID via allows you to select between the different creation methods for RAID 0, RAID 1, and RAID 10. The following table gives examples of when each is appropriate.

RAID level	Create via	When appropriate
RAID 0	No Init	Creating a RAID 0 on new drives.
RAID 0	Migrate[1]	Creating a RAID 0 from one new drive and one drive with data you wish to preserve.
RAID 1 RAID 10	Build[1]	Any time you wish to create a RAID 1 or RAID 10, but especially if you have data on one drive that you wish to preserve.
RAID 1 RAID 10	Clear	Creating a RAID 1 or RAID 10 on new drives, or when you want to ensure that the array contains no data after creation.
RAID 1 RAID 10	Quick Init	Fastest way to create a RAID 1 or RAID 10. Appropriate when using new drives.

Note 1. If you select Migrate for RAID 0, or Build for RAID 1 or RAID 10, you will be asked to select the source drive. The contents of the source drive will be preserved. However, the data on the new drive will be lost.

(*Notes:)

* Before adding a new drive to an array, back up any data contained on the new drive. Otherwise, all data will be lost.

* If you stop the Build or Clear process on a RAID 1 or RAID 10 from ACU you can only restart it from Adaptec Storage Manager -Browser Edition. (See C-4 for details.)

* A RAID 1 created using the Quick Init. Option may return some data if you later run a consistency check. This is normal and is not a cause for concern.

* The ACU allows you to use drives of different sizes in a RAID 1 or RAID 10. However, during a build operation , only the smaller drive can be selected as the source or first drive.

* When migrating from single volume to RAID 0, migrating from a larger drive to a smaller drive is allowed. However, the destination drive must be at least half the capacity of the source drive.

* Adaptec does not recommend that you migrate or build an array on Windows dynamic disks (volumes), as it will result in data loss.

(**Caution**: Do not interrupt the creation of a RAID 0 using the Migrate option. If you do, there is no way to restart, and no way to recover the data that was on the source drive.)

5 When you are finished, press Done.

C. Initializing Disk Drives

If an installed disk does not appear in the disk selection list for creating a new array, or if it appears grayed out, you may have to initialize it before you can use it as part of an array. Drives attached to the controller must be initialized before they can be used in an array.

(**Caution**: Initializing a disk overwrites the partition table on the disk and makes any data on the disk unaccessible. If the drive is used in an array, you may not be able to use the array again. Do not initialize a disk that is part of a boot array. To determine which disks are associated with a particular array, see the section-"Viewing Array Properties".)

To initialize drives:

1. Turn on your computer and press Ctrl+A when prompted to access the ARC utility.

2. From the ARC menu, select Array Configuration Utility (ACU).

3. Select Initialize Drives.

4. Use the up and down arrow keys to highlight the disk you wish to initialize and press Insert.

5. Repeat Step 4 so that both drives to be initialized are selected.

6. Press Enter.

7. Read the warning message and ensure that you have selected the correct disk drives to initialize. Type Y to continue.

Using the Disk Utilities

The Disk Utilities enable you to format or verify the media of your Serial ATA hard disks.

To access the disk utilities:

1. Turn on your computer and press Ctrl+A when prompted to access the ARC utility.

2. From the ARC menu, select Disk Utilities.

3. Select the desired disk and press Enter. You are offered the following options:

* Format Disk—Simulates a low-level format of the hard drive by writing zeros to the entire disk. Serial ATA drives are low-level formatted at the factory and do not need to be low-level formatted again.

(**Caution:** Formatting destroys all data on the drive. Be sure to back up your data before performing this operation.

* Verify Disk Media—Scans the media of a disk drive for defects.

Notes